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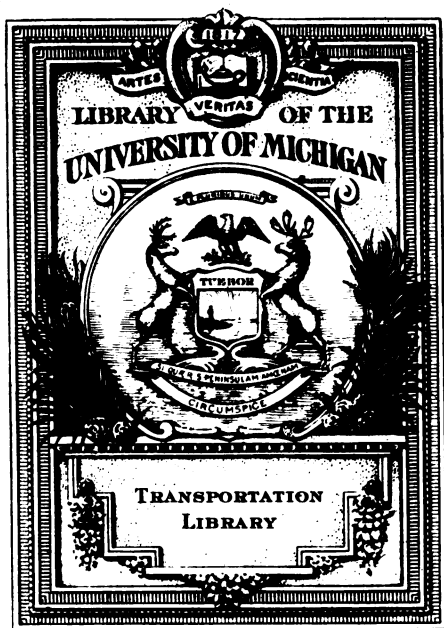
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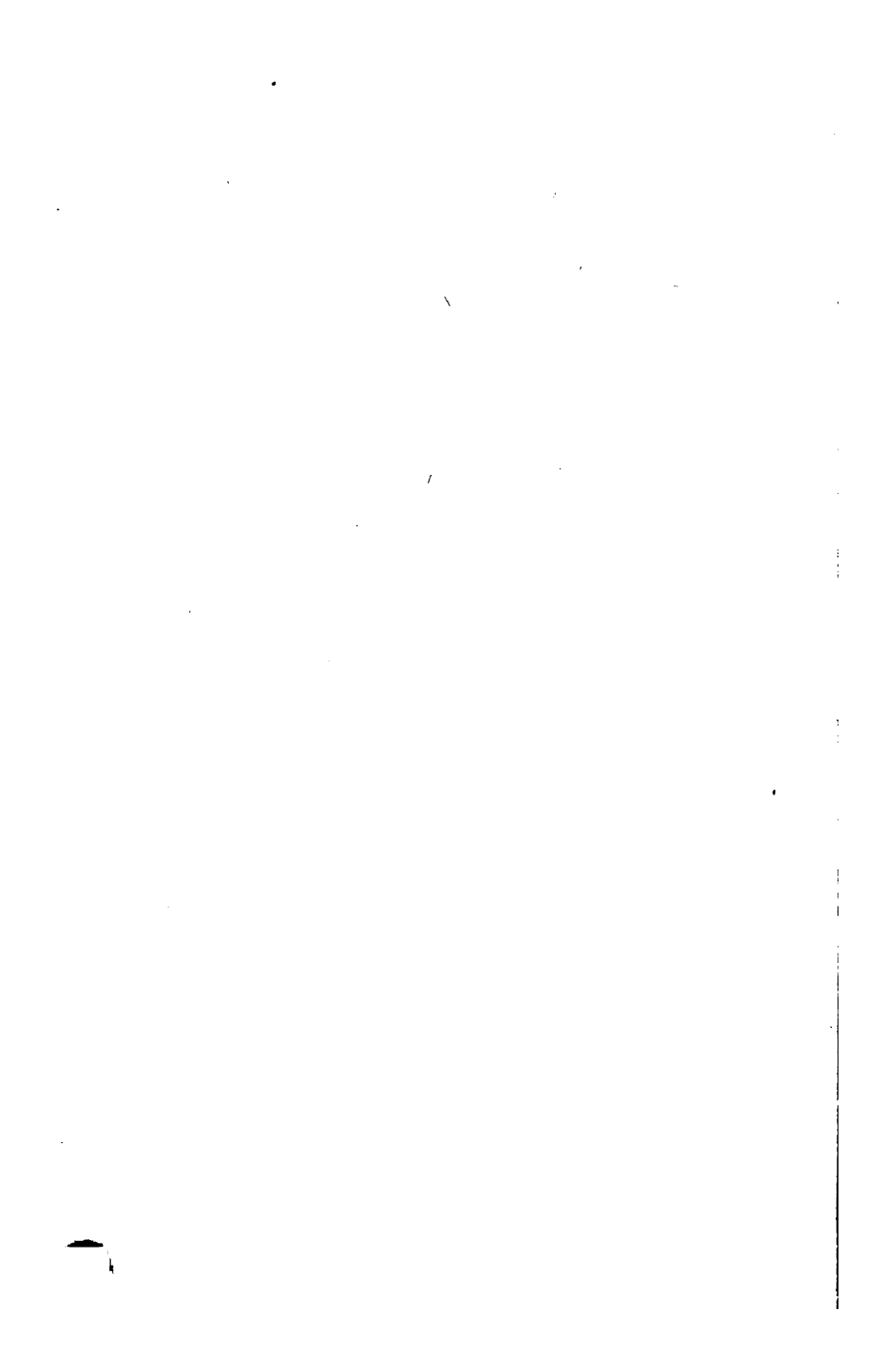


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## TRAVELLING HOURS.

# CURIOSITIES OF COMMUNICATION

THE ROAD.

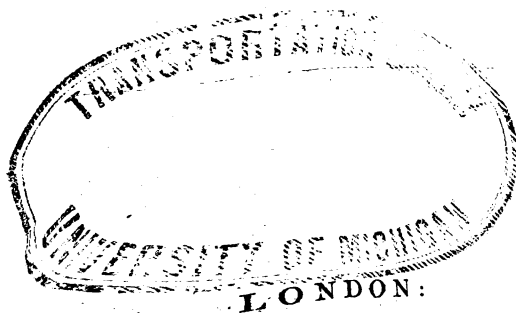
THE RAILWAY.

THE ELECTRIC TELEGRAPH.

THE SAIL AND THE STEAMER.

OCEAN STEAMERS.

FOREIGN MAILS.



LONDON:

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1851.

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# CURIOSITIES OF COMMUNICATION:

THE ROAD.

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## CURIOSITIES OF COMMUNICATION.

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### THE ROAD.

Who made our roads? Engineers before McAdam. "Some imagine," says Camden, "that these ways were made by one Mulmutius, God knows who, many ages before the birth of Christ; but this is so far from finding credit with me, that I positively affirm they were made from time to time by the Romans. When Agricola was lieutenant here, Tacitus tells us, the people were commanded to carry their corn about, and into the most distant countries, not to the nearest camps, but to those that were far off, and out of the way. And the Britons, as the same author has it, complained that the Romans put their hands and bodies to the drudgery of clearing woods and paving fens." The Britons, no doubt, had roads; but we think it is as little doubtful that the Romans made the solid roads of which we constantly discover such wonderful remains. They were indeed great road-makers, these kings of the world; and they went about their work in a scientific style, like the iron road-makers of our own age, with

. . . . . labouring pioneers,  
A multitude with spades and axes armed,  
To lay hills plain, fell woods, or valleys fill.  
Or where plain was raise hill, or overlay  
With bridges rivers proud, as with a yoke.

PARADISE REGAINED.

Their work has lasted. Their "highways from sea to sea" cannot be traced through their whole lines with perfect distinctness; but enough can be traced to show the genius of the great civilizers. All old writers agree that there were four chief ways in England; modern researches have traced other

K.A.

trunk roads than these four of the Watling Street, the Erming Street, the Ikenald Street, and the Fosse. What the great lines of Railways have accomplished, according to the wants of our age, within the last twenty years, the old roads accomplished sixteen hundred years ago. They made this island, to a certain extent, one whole. We have a circuitous railway from Dover to London; the Romans had their direct road, the Watling Street, through Rochester. The Great Western Railway follows its sinuous course from London to Bath; the Romans had a direct road through Staines, Silchester, and Marlborough, to their great city of medicinal waters. If the descriptions of the Fosse Way may be relied upon, it followed very closely the present track of the Great Western from Totness to Bristol; and connected the Midland Counties, as far as Lincoln, with the Western coasts, as completely as the net-work of railways does at this day. The Ikenald way is held to have connected the Eastern coast with the interior, as the Eastern Counties Railway now effects the same object. The Erming Street is affirmed to have run from St. David's to Southampton, a line which railways have yet to thread. Lastly, the Watling Street, after it had reached London from Dover, is understood to have passed towards the North to Saint Alban's, and thence, in a direct line, very little verging from that which we call the Great North Road, to York and Chester-le-Street, going straight to its point, like the Great Northern Railway. For purposes of internal communication "from sea to sea," the direction of the Roman roads was, there can be little dispute, sufficiently complete. The manufacturing element has demanded new combinations.

Here, then, sixteen hundred years ago, were direct roads, with bold cuttings, and solid terraces worked in stone and cement, founded on piles where the soil was marshy, raised upon piers where it was necessary to gain elevation; and over these, for five centuries of Roman dominion, moved the legions of the mighty empire,

"In coats of mail, and military pride."

Then succeeded the fierce strifes of the Heptarchy—the devastations of the Dane—the plunder of the Norman—the struggle between the Crown and the Barons—the wars of England and Scotland—the battles of the Roses;—during each of which epochs the country made slight advances, if any, in the real business of civilization, as compared with the Roman period.

With the Tudor dynasty came comparative quiet, and, with quiet, increased commercial intercourse. There had always been a coasting trade. In 1489, the Bishop of Durham writes from his manor of Auckland, to Sir John Paston, at Caister, near Yarmouth, that he sends his Gentleman Usher to negotiate a matter of business, "forasmuch as I have coals and other things in these parts, and also ye have in those parts corns, wine, and wax; and as I am informed ye be not evil willed to deal with me, no more than I am to deal with you, in uttering, and also in receiving of such things, the which might be to the profit of us both." The bishop had a sensible notion of the real objects of trade. These exchanges were to be "to the profit of either of us, whereby our familiarity and friendship may be increased in time to come." Such a desire for communication, between the influential men of districts producing different commodities, would necessarily make and uphold roads, and improve harbours. Let us see what roads the people of England had in the time of Elizabeth.

William Harrison, in his 'Description of England,' prefixed to Holinshed's Chronicle, has "a Table of the best thoroughfares and towns of greatest travel:" and he says, "Those towns that we call thoroughfares have great and sumptuous inns builded in them, for the receiving of such travellers and strangers as pass to and fro." We have traced upon a map the various lines of this old Itinerary; and it is remarkable how little appears to have been added to the means of internal communication since the days of the Roman roads. Indeed, with a few exceptions, the Roman roads appear to have determined the great highways of the sixteenth century. We will briefly describe them. 1. From the south-east coast there is the road from Dover to London. 2. From the south-west coast there is a road from the extreme point of Cornwall to Exeter, by Launceston and Okehampton, and thence to London by Shaftesbury and Salisbury. 3. There are two roads from Norfolk and Suffolk to London,—one from Walsingham, by Newmarket, till it joins the north road near Royston; the other from Yarmouth to Ipswich, Colchester, and Chelmsford. 4. From South Wales to London, there is a road from St. David's, by Caermarthen and Hay to Gloucester, and thence by Cirencester, Farringdon, Abingdon, Henley, and Maidenhead; where it unites with, 5, the road from London to Bristol, by Reading, Marlborough, and Chippenham. The northern roads constitute the longest and most important lines. They are, 6, the road from London

to Cockermouth, by St. Alban's, Dunstable, Daventry, Coventry, Lichfield, Stone, Warrington, Preston, Lancaster, Kendal, and Keswick; 7, the road from London to Berwick, by Ware, Huntingdon, Stamford, Grantham, Newark, York, Darlington, Durham, Newcastle, Morpeth, Alnwick, and Belford; 8, the road from North Wales,—from Caernarvon to Conway and Chester, and thence to Newcastle-under-Lyne, where it joins the road from London to Cockermouth. There are, in addition to these eight great lines, the road from London to Oxford, by Uxbridge; and the road from London to Cambridge, by Saffron Walden.

The most cursory inspection of the map of England will show how imperfect was the nature of our internal communication, when the lines we have recited were the only great thoroughfares. But it must also be borne in mind, that the manufacturing hives of English population were not yet formed. We are speaking of the time which preceded turnpikes by a century, canals by two centuries, and railways by three centuries. The transition from one state of things to the other involves some curious particulars.

Cross-roads, as well as the great thoroughfares, were of course absolutely necessary for carrying on the business of life. Some were merely lanes over the natural soil,—some paved roads for pack-horses. Annual labour for the repair of roads was first imposed by the statute of the 2nd and 3rd Philip and Mary, "for amending of highways, being now both very noisome and tedious to travel in, and dangerous to all passengers and carriages." Harrison says that the statute was constantly evaded by the covetousness of the rich and the laziness of the poor; that parish surveyors took care to have good roads to their own fields, but neglected those that led from market to market; and that encroachments were daily made upon the highways by covetous landowners, so "that whereas some streets within these five-and-twenty years have been in most places fifty feet broad, according to the law, whereby the traveller might either escape the thief, or shift the mire, or pass by the laden cart, without danger to himself or his horse; now they are brought unto twelve, or twenty, or six-and-twenty at the most." Local *jobbing*, we thus see, is an hereditary accomplishment. The statute for amending of highways gave power to the jobbers, and the highways became worse. The evil went on for another century, till at last came the turnpike system for its remedy. The first Turnpike Act was passed in 1663 (15th



Charles II.), and its preamble shows what a state of road perfection we had reached, even after the establishment of the Post: "Whereas the ancient highway and post-road leading from London to York, and so into Scotland, and likewise from London into Lincolnshire, lieth for many miles in the counties of Hertford, Cambridge, and Huntingdon, in many of which places the road, by reason of the great and many loads which are weekly drawn in waggons through the said places, as well by reason of the great trade of barley and malt that cometh to Ware, and so is conveyed by water to the city of London, as other carriages, both from the north parts, as also from the city of Norwich, Saint Edmundsbury, and the town of Cambridge, to London, is very ruinous, and *become almost impassable*, inso-much that it is become very dangerous to all his Majesty's liege people that pass that way." The "ancient highway and post-road leading from London to York. and so into Scotland." is on many accounts one of the most important lines of the country, and has been more travelled on than any other line. For this reason, probably, there are more incidental descriptions of the mode of travel on this road to be found in books. than all which refer to other roads. From its great length, its passage through the border country, and its onward progress through what was another kingdom, the north road offers very striking contrasts between its ancient and its modern state.

Those who are not tolerably familiar with the Memoir Literature of the sixteenth and seventeenth centuries, will have some difficulty to comprehend how our ancestors moved about from place to place, and carried on the business of communication with distant inland parts. The mode of conveyance was so universal, and so established, that it rarely offers itself to any especial notice. Till the beginning of the eighteenth century we were almost wholly an EQUESTRIAN people. Harrison describes "the excellent paces" of our saddle-horses as peculiar to those of our soil; and says, that "our countrymen, seeking their ease in every corner where it is to be had, delight very much in this quality." From the days of the Wife of Bath, "girt with a pair of spurrés sharp," to the days of Queen Elizabeth, we have scarcely a trace of ladies accomplishing their peregrinations in any other manner than that which Chaucer has recorded:

"Upon an ambler easily she sat."

Luxury had its appliances ready for this almost exclusive mode of travel. "A lover of his country," who, in 1673, saw that coaches would be the ruin of the kingdom, says, "Before these coaches were set up, travellers rode on horseback; and men had boots, spurs, saddles, bridles, saddle-cloths, and good riding suits. . . . Most gentlemen, before they travelled in their coaches, used to ride with swords, belts, pistols, holsters, portmanteaus, and hat-cases; for when they rode on horseback they rode in one suit, and carried another to wear when they came to their journey's end, or lay by the way. . . . And if they were women that travelled, they needed to have safeguards and hoods, side-saddles, and pillions, with strappings, saddle or pillion-cloths, which, for the most part, were either laced or embroidered." The saving of much of this expenditure, by travelling in coaches, the writer holds, is the ruin of trade. "For, formerly, every man that had occasion to travel many journeys yearly, or to ride up and down, kept horses for himself and his servants, and seldom rid without one or two men." In 1526, the Earl of Cumberland rode from Skipton to London, with thirty-three servants. (*Whitaker's Craven*.) In 1582, the Earl of Shrewsbury writes to a dependant: "I think my company will be twenty gentlemen and twenty yeomen, besides their men and my horse-keepers. I think to set forwards about the 11th of September, from Wingfield to Leicester, to my bed, and to make but four days' journey to London." (*Lodge's Illustrations*.) In 1640, the wife of the last Earl of Cumberland rode from London to Londesborough, having thirty-two horses in her train; and the journey occupied eleven days. These slow progresses were the relics of the old times of sumpter-horses, when princes and nobles travelled with vast cavalcades, like an oriental caravan. We must not imagine that all equestrian travelling was at this slow rate. James I. of England was indeed nearly five weeks on his padded saddle, in his royal progress from Edinburgh to London; but Sir Robert Carey, determining to be the first to tell James that he was king of England, stole out of Richmond Palace, at three o'clock of the morning of Thursday, the 24th of March, and reached Edinburgh on the night of Saturday, the 26th, the king having gone to bed by the time he had knocked at the gate. This ride of four hundred miles, in seventy hours, gives one an elevated notion of the travelling accommodations of two centuries and a half ago. But it must be borne in mind that such instances were the exceptions to the rule of slow

travelling. Although the Post was not established by law, there were post-masters, at the end of the sixteenth century, on all the great lines of roads; and, for a sufficient consideration, they would furnish such a traveller as Sir Robert Carey with abundant horses, that he might ride till they dropped,—as, indeed, he records one of his horses to have done. Then, again, although the roads were bad, the equestrian had many a mile of the smooth turf of an unenclosed country to gallop over. Let it not be forgotten, that if Sir Robert Carey rode from London to Edinburgh at the rate of six miles an hour, keeping on night and day, with relays of horses, the general communication of the country was so slow, that although Elizabeth died at two o'clock of the morning of Thursday, the 24th of March, and James was proclaimed king, at London, on the same morning, “yet the news of it reached not the city of York until Sunday, March the 27th.” (*Continuation of Stow's Annals.*)

The days before the Post were days when those who left their houses, for distant parts of England, were more separated from their friends than the North American emigrant of our own times. The transmission of intelligence across the Atlantic is now an easier thing than the old conveyance of a letter two hundred miles, upon a cross road. The historian of Craven, speaking of 1609, says, “At this time the communication between the north of England and the universities was kept up by carriers, who pursued their tedious but uniform route with whole trains of packhorses. To their care were consigned not only the packages, but frequently the persons, of young scholars. It was through their medium, also, that epistolary correspondence was managed; and as they always visited London, a letter could scarcely be exchanged between Yorkshire and Oxford in less time than a month.” Charles I. seems, in 1635, to have resolved to remedy this evil, by the establishment of the home post-office. In his proclamation of that year, he says, that there had been no certain intercourse between England and Scotland; and he therefore commands a running post to be established between London and Edinburgh, to go thither and come back again in six days; and for other roads there are promised the same advantages. In 1660 the General Post-office was established by Act of Parliament; and all letters were to be sent through this office, “except such letters as shall be sent by coaches, common known carriers of goods by carts, waggons, and pack-horses, and shall be carried

along with their carts, waggons, and pack-horses respectively." The Post-master General and his deputies, under this statute, and no other person or persons, "shall provide and prepare horses and furniture to let to hire unto all thorough posts and persons riding in post, by commission or without, to and from all and every the places of England, Scotland, and Ireland, where any post-roads are." We find, by various clauses of this Act, that the post-master was also to furnish a guide with a horn to such as ride post,—that he was to furnish horses within half an hour after demand,—and that if he could not accomplish this, persons might hire a horse where they could, and sue the post-master for a penalty. The country post-master was an ancient functionary, who had long been in the habit of attending to the wants of those who bore letters inscribed, "Haste, haste, post haste." He was generally an inn-keeper. Taylor, the water poet, in his 'Penniless Pilgrimage' from London to Scotland, in 1618, has described one that might rival any Boniface on record; "From Stamford, the next day, we rode to Huntingdon, where we lodged at the post-master's house, at the sign of the Crown; his name is Riggs. He was informed who I was, and wherefore I undertook this my penniless progress; wherefore he came up to our chamber, and supped with us, and very bountifully called for three quarts of wine and sugar, and four jugs of beer. He did drink and begin healths like a horse-leech, and swallowed down his cups without feeling, as if he had had the dropsy, or nine pound of sponge in his maw. In a word, as he is a post, he drank post, striving and calling by all means to make the reckoning great, or to make us men of great reckoning. But in his payment he was tired like a jade, leaving the gentleman that was with me to discharge the terrible shot, or else one of my horses must have lain in pawn for his superfluous calling and unmannerly intrusion."

The CARRIERS of England have always been a *progressive* body, in more than one sense of the word. They were amongst the first in our days to see what railways would accomplish for the transit of goods and passengers. They were the first, more than two centuries ago, to change the mode of passenger-conveyance from the riding-horse to the waggon. They brought the Oxford scholars, as we have seen, out of the North with their pack-horses. The most famous of all the old carriers was he of Cambridge, of whom Milton wrote,

"Here lies old Hobson; death hath broke his girt,  
And here, alas! hath laid him in the dirt."

He it was that gave rise to the saying of "Hobson's choice;" for he obliged his customers for hackney-horses to take the one that stood next the stable-door. His trade of horse-letting was a refinement upon the old trade of the postmaster: he intrusted a horse to the Cambridge scholar for a pleasure ride, and he sent no guide to feed the horse and bring it back. He was a pack-horse carrier. It was not till after his palmy days that the innovation of waggons came in, in which passengers were carried from city to city. But long did the passenger-waggon and the pack-horse continue to travel in good fellowship. Roderick Random tried both conveyances: "There is no such convenience as a waggon in this country (Scotland), and my finances were too weak to support the expense of hiring a horse. I determined, therefore, to set out with the carriers, who transport goods from one place to another on horseback; and this scheme I accordingly put in execution on the 1st day of November, 1739, sitting upon a pack-saddle between two baskets, one of which contained my goods in a knapsack. But by the time we arrived at Newcastle-upon-Tyne, I was so fatigued with the tediousness of the carriage, and benumbed with the coldness of the weather, that I resolved to travel the rest of my journey on foot, rather than proceed in such a disagreeable manner." We of this age complain that the penny-a-mile passengers in covered railway carriages, which only go some fifteen miles an hour, are hardly used. Let us contrast this case with that of the pack-horse traveller. Seated in the throne which Roderick Random occupied, he sallied forth at "four by the day," when the horses were "packed;" forgetting, for a little while, the uneasiness of his seat, by the remembrance how he had been "stung like a tench." He is stuck in the midst of a file of fifty horses, a large companionship for safety. For a little while he is on the king's highway, and the bells go cheerily as he crosses some pleasant common. Perchance, as he ascends the wide moorlands, the clouds darken around him, the mist falls heavily, the carriers can see no track; but by an unerring instinct the cautiously stepping horses keep their file, and ask no better guide than the sound of their sagacious leader's bells. He will not lead them into boggy places; he will keep steady, even when man has ceased to direct him. If the way is unusually rough, the old and feeble horses lag behind; but they never break the order of their march, and they ultimately push on, even if they should die in their perseverance. In Bewick's 'History of Quadrupeds' is an interesting anecdote of a pack-

horse, thus exerting himself to maintain his place, dropping down dead when he reached the inn-yard. The inexperienced passenger must have needed some courage in these passages across the semi-deserts of uncultivated England. But soon he is in a lane some four feet wide,—sometimes floundering in the mud—at other times slipping upon a paved causeway, with a thick sludge on either side of the narrow track. In the hills of Derbyshire have we ridden the sure-footed pony of the country down these winding roads, shut out from the wide prospect around us by overhanging hedges—a privation which the pack-horse traveller little cared for. But not only in Derbyshire, in the days before men sought the picturesque, were such roads travelled over, but in the very thickest of our metropolitan suburb. Hagbush Lane, which was described by William Hone only twenty-five years ago, but which has now vanished, was the ancient bridle or pack-horse road from London to the North, and extended by the Holloway back road, as far as the City-road, near Old Street. “Some parts of Hagbush-lane,” says Hone, “are much lower than the meadows on either side.” At one time a terraced ridge, at another a deep rut, the pack-horse road must have been to the unaccustomed traveller a somewhat perilous pass. Happy would he be when the house which promised “good entertainment for man and horse,” and which, in the early days of English art, hung out a representation of the animal he bestrode, which might be mistaken for a dromedary,—happy would he be when the “watering-time” arrived. Well-earned would be the rest. Again would the cavalcade be in movement, “till dewy eve.”—again would come the rasher and eggs for supper, with the black jack of home-brewed ale; again the sound sleep, in spite of night plagues; and again the early morning journey. A fortnight between York and London would be a quick passage. Well, there might be worse arrangements for a contemplative traveller; but for ourselves, being somewhat fearless of innovations, we must avow a preference for the Express-train.

Our antiquarian annalist, Stow, records that, in 1605. LONG WAGGONS for passengers and commodities travelled to London from Canterbury and other large towns. According to this authority, they were known as early as 1564. “The lover of his country,” whom we have already quoted, has no violent objection to these “long waggon coaches,” as he calls them. They plead some antiquity; “they were first set up.” Moreover, they are not guilty of the sin of expedition. Compared

with the objects of his hatred, the stage-coaches, they are innocent things: "They travel not such long journeys, go not out so early in the morning, neither come in so late at night; but stay by the way, travel easily, without jolting men's bodies, or hurrying them along, as the running coaches do." These convenient, creeping things had a safe existence for a century or two, and bore up bravely against the sneers of the "flying-coaches," that went four miles an hour. Roderick Random, as we have said, tried both the pack-horse and the waggon. This waggon was "the long waggon" of Stow; the "long waggon-coach" of "the lover of his country." Not much more than a hundred years ago, there was a vehicle moving on the Great North Road, in which passengers, who assumed to be gentlefolks, were travelling from York to London, at the fare of a shilling a-day,—not being more than a fortnight in the transit. The description which Smollett gives of his ride to London is known to have been derived from his own experience. He and his faithful friend, Strap, having observed the waggon a quarter of a mile before them, speedily overtook it; and ascending the convenience by a ladder, tumbled into the straw, under the darkness of the tilt, amidst four passengers, two gentlemen, and two very genteel specimens of the fair sex. When they arrived at the inn where they were to lodge for the night, Captain Weazel and his lady desired a room for themselves, and a separate supper; but the impartial inn-keeper replied, that "he had prepared victuals for the passengers in the waggon, without respect of persons." Roderick agrees to give ten shillings for his passage to London, provided Strap, who was to trudge by the side, should change places with him when he was disposed to walk. The mistakes, the quarrels, and the mirth of the passengers, are told by the novelist with a vivacity which would be admirable without its coarseness. They got tolerably reconciled to each other after the first five days' rumbling in the straw. "Nothing remarkable happened during the remaining part of our journey, which continued six or seven days longer. At length we entered the great city, and lodged all night at the inn where the waggon put up."

Let not the "long stage-waggon," which thus kept alive a monthly communication between Yorkshire and London, and carried, according to Smollett, no less dignified persons than a medical student, an ensign in a marching regiment, and a City money-lender, be confounded with the broad-wheeled waggon that, after being half drowned by the waters of the canal, has

now been swept from the surface of the earth by the fire of the railroad. Have we not ourselves heard the merry bells of the team, breasting their way right in the centre of the broad Bath road, unyielding to coach or currie? Have we not seen the bright eye glancing from the opening of the tilt behind, as the ponderous wain is moving beside the village green, and the stalwart driver tells the anxious maiden that it is only one more mile to the turnpike where she is to meet "the young man?" Have we not sat beneath the branching elm which fronts some little inn where waggons congregate, and heard much goodly talk about the dearness of horses, and the craft of Lunnun? They are gone,—these once-familiar scenes:

"They live no longer in the faith of reason;"

but they will live for ever in such pictures as that our friend Creswick has painted of 'The London Road a hundred years ago.'

We are arrived at the next phase of our travelling progress,—the introduction of *STAGE-COACHES*, towards the end of the seventeenth century. But before we proceed to this subject, let us say a few words upon the *roads of that time*.

The turnpike upon the great Northern road does not appear to have done much for its reparation. In the 'Diary of Ralph Thoresby,' under the date of October, 1580, we find this entry: "To Ware, twenty miles from London, a most pleasant road in summer, and as bad in winter, because of the depth of the cart-ruts, though far off as bad [far less bad] as thence to Buntingford and Puckeridge, and part of the way to Royston." Fifteen years later, we have a still more gloomy account of the state of the same road in this Diary: "Rode by Puckeridge to Ware, where we baited, and had some showers, which raised the washes upon the road to that height that passengers that were upon the road swam, and a poor higgler was drowned . . . . I have the greatest cause of thankfulness for the goodness of my heavenly Protector, that, being exposed to greater dangers by my horse's boggling at every coach and waggon we met, I received no damage, though the ways were very bad, the ruts deep, and the roads extremely full of water; which rendered my circumstances (often meeting the loaded waggons in very inconvenient places), not only melancholy, but really very dangerous." This state of things was as late in the season as the 19th of May. We cannot be surprised that poor Ralph Thoresby, with the feeling of these perils, caused public prayers



to be offered up for one going a journey, previous to leaving home on another occasion. The frightful condition of the principal road out of London, after the passing of the Turnpike Act for its amendment,—which Act imposed a toll pretty heavy, for those days, upon “horses, carts, coaches, waggons, droves and gangs of cattle,”—may have arisen from the laxity with which the toll was collected. It is said that the toll was so unpopular, that “the mob” broke the toll-gates. We do not exactly see what “the mob,” in the usual sense of the term, had to do with the matter. But we can picture to ourselves a series of contests between the toll-keepers and a stout body of drovers, swineherds, carriers, and waggoners, that in those days of insufficient police must have produced many a forcible evasion of the law. It is not difficult, also, to believe that the first introduction of the system would be offensive to the richer dwellers in the country, who, in the pursuit of their field-sports, were not very considerate as to the effect of trespass, and were not much accustomed to have their wills thwarted by authority of any sort. The old ballad of the Pinder of Wakefield shows a stout fellow with a quarter-staff, ready to break the heads of encroachers upon private property :

“Now turn again, turn again, said the Pinder,  
For a wrong way you have gone;  
For you have forsaken the King's highway,  
And made a path over the corn.”

In the middle of the seventeenth century, when roving blades had not forgotten the licence of the civil war, the toll-man might, in the same manner as the Pinder, have to enforce his demand of “a penny for your horse,”—“sixpence for your coach.” Any attempt or refusal to distrain the said horse would invariably end in mutual blows.

We have abundant evidence that stage-coaches were in use soon after the middle of the seventeenth century. In 1663, Mr. Edward Parker, writing to his father, who lived near Preston, says: “I got to London on Saturday last. My journey was noways pleasant, being forced to ride in the boot all the way. The company that came up with me were persons of great quality, as knights and ladies. My journey's expense was thirty shillings. This travel hath so indisposed me, that I am resolved never to ride up again in the coach.” (*Archæologia*, vol. xx.) Let us turn aside for a moment, to explain what “the boot” was. There were two boots to these old coaches—

uncovered projections from each side of the carriage. Taylor, the Water Poet, thus describes them : " It [the coach] wears two boots, and no spurs, sometimes having two pair of legs in one boot ; and oftentimes, against nature, most preposterously, it makes fair ladies wear the boot. Moreover, it makes people imitate sea-crabs, in being drawn sideways, as they are when they sit in the boot of the coach." In this boot, then, travelled unhappy Edward Parker. He does not tell us the rate at which he travelled. We will supply that information from other sources.

From the Diary of Sir William Dugdale, it appears that in 1659 he set forward to London in the Coventry coach, on the 2nd of May, and arrived on the 4th of May—three days. The Diary of a Yorkshire clergymen (quoted in *Archæologia*, vol. xx.), shows that in the winter of 1682, a journey from Nottingham to London, in a stage-coach, occupied four whole days. In Antony à Wood's Diary, we are told, that in 1667 he travelled from Oxford to London in the coach, and was two days in accomplishing the passage. A few years after, the feat was performed in thirteen hours ; but in 1692 it was again found necessary to give two days to the journey, from Michaelmas to Lady-day. " The lover of his country," however, has furnished us the most complete picture of coach travelling, in 1673. The long journeys were from London to Exeter, Chester, or York. On these roads the fare was forty shillings in summer, and forty-five shillings in winter, each way. The coachman was changed four times, and a passenger was expected to give each coachman a shilling at the end of the stage, besides a total of three shillings for drink to the coachmen. at their halting-places. In summer, the time occupied in riding was four days,—in winter, six days. But these were long days. The complaining writer says : " What advantage is it to men's health to be called out of their beds into these coaches an hour before day in the morning, to be hurried in them from place to place, till one hour, two, or three, within night ; insomuch that, after sitting all day,—in the summer time stifled with heat and choked with dust, or in the winter time starving and freezing with cold or choked with filthy fogs,—they are often brought into their inns by torch-light, when it is too late to sit up to get a supper ; and next morning they are forced into the coach so early that they can get no breakfast ?" Added to these troubles, the fault-finder alleges the grievances of crying children, and crowds of boxes and bundles. He gives us some notion of the

roads and the safety of the carriages: "Is it for a man's health to travel with tired jades, to be laid fast in the foul ways, and forced to wade up to the knees in mire; afterwards sit in the cold till teams of horses can be sent to pull the coach out? Is it for their health to travel in rotten coaches, and to have their tackle, or perch, or axletree broken, and then to wait three or four hours, sometimes half a day, to have them mended, and then to travel all night to make good their stage?" This is a queer state of things,—a little exaggerated, perhaps, but in the main true. It is remarkable how long the roads and the coaches continued to be execrable.

The express train of the Great Western Railway goes to Exeter, a hundred and ninety-three miles, in four hours and a half. In 1725, the stage-coach journey from London to Exeter occupied four summer days. The passengers were aroused every morning at two o'clock, left their inn at three, dined at ten o'clock, and finished their day's labour at three in the afternoon.—(*Mrs. Manley's Journey.*) In 1739, Mr. Andrew Thompson, of Glasgow, with a friend, left Glasgow to ride to London. There was no turnpike-road till they came to Grantham, within a hundred and ten miles of the metropolis. Up to that point they travelled on a narrow causeway, with an unmade soft road on each side. As strings of pack-horses met them from time to time, they were obliged to plunge into the side-road, and had often difficulty in scrambling again upon the causeway.—(*Cleland's Glasgow.*) As late as 1763, there was only a coach once a month from Edinburgh to London, which was twelve or fourteen days on the road. In the south of England we made more rapid strides to perfection. We have before us a very curious bill of the 'Alton and Farnham Machine,' dated 1750, which is headed with an engraving, furnishing the best representation of the coach of a century ago that we have seen. The clumsy vehicle carries no passengers on the roof: but it has a large basket,—literally a basket,—swung behind, for half-price passengers. The coachman has four horses in hand, and a postilion rides a pair of leaders. This is truly a magnificent equipage, and it accomplished its journey in a marvellously short time, starting at six in the morning, and arriving duly the same night. This journey of forty-seven miles in one day was a feat; and well might the vehicle which accomplished it be dignified by the name of "Machine." The name became common; and hence stage-coach horses were called "Machiners."

Of the travelling by private carriages in those days of the most villainous cross-roads we have abundant evidence. The Duke of Somerset, who died in 1748, was always compelled by the badness of the roads to sleep at Guildford, on his way from Petworth to London. A letter of one of the Duke's servants to another servant, announces his master's intention to arrive at Petworth, from London; and adds directions, that "the keepers and others who knew the holes and sloughs, must come to meet his Grace, with lanthorns and long poles, to help him on his way." The grandfather of the present Duke of Buckingham had an inn built for his special accommodation at Winslow, as the journey from Stowe to London could not be accomplished in one day. Vanbrugh, in the '*Provoked Husband*,' has given us an amusing, and, we have little doubt, faithful account of the progress of a Yorkshire family to town in their own equipage. According to the honest record of John Moody, their serving man, there was "Nothing but mischief! Some devil's trick or other plagued us, aw th' day long! Crack goes one thing; Bawnce! goes another. Woa, says Roger—Then souse! we are all set fast in a slough. Whaw! cries Miss!—scream go the maids! and bawl! just as thof' they were stuck! And so, mercy on us! this was the trade from morning to night."

From the days of the first turnpike a whole century appears to have passed before any very great improvements were effected in the roads, or in the vehicles travelling upon them. Mr. McCulloch says, "It was not till after the peace of Paris, in 1763, that turnpike roads began to be extended to all parts of the kingdom; and that the means of internal communication began, in consequence, to be signally improved." (*Account of the British Empire*.) Mr. Porter, in an article contributed to '*The Companion to the Almanac*,' 1837, speaks of the condition of a road only thirty-six miles from London, about the same period:—"A gentleman now living at Horsham, in Sussex, has stated, on the authority of a person whose father carried on the business of a butcher in that town, that in his time the only means of reaching London was either by going on foot or on horseback, the latter method not being practicable at all periods of the year, nor in every state of the weather; and that the roads were never at that time in such a condition as to admit of sheep or cattle being driven upon them to the London markets; for which reason the farmers were prevented sending thither the produce of their lands, the immediate neighbour-

hood being, in fact, their only market. Under these circumstances the quarter of a fat ox was commonly sold for about fifteen shillings, and the price of mutton was one penny farthing per pound." Mr. Porter, in his 'Progress of the Nation,' also informs us, that "when it was in contemplation to extend turnpike-roads from the metropolis to more distant points than those to which they had before been carried, the farmers in the metropolitan counties petitioned Parliament against the plan, fearing lest their market being invaded by so many competitors, who would sell their produce more cheaply, they should be ruined." Two centuries before these wise farmers, William Harrison,—in many things a shrewd observer—thought it would be good "if it were enacted that each one should keep his next market with his grain, and not to run six, eight, ten, fourteen, or twenty miles from home to sell his corn, where he doth find the highest price." Harrison saw clearly enough that communication equalised prices; although he would have kept down prices, and therefore kept down all profitable employment, by narrowing the market of the producers. Dr. Johnson appears to have had somewhat similar notions of public advantage. In 1784 he visited Mr. Windham, who made a note of his Conversations, amongst which we find the following: "Opinion about the effect of turnpike-roads. Every place communicating with each other. Before, there were cheap places and dear places. Now, all refuges are destroyed for elegant or genteel poverty. Disunion of families, by furnishing a market to each man's ability, and destroying the dependence of one man upon another." To have "cheap places and dear places"—to maintain "the dependence of one man upon another"—has been the struggle of class interests up to this hour. Roads and railroads and steamboats have annihilated the one remnant of feudality,—local cheapness purchased by general dearness: and the penny-a-mile trains would extinguish all that is unhealthy in "the dependence of one man upon another," if the other remnant of feudality, the law of parish settlement, were broken up.

The extension of turnpike-roads through the country at last brought about the ultimate perfection of coach-travelling,—THE MAIL. More than sixty years ago was this great engine of our civilisation first set in motion. Before Mr. Palmer suggested his improvements to the Government, letters sent by the post, which left Bath on Monday night, were not delivered in London till Wednesday afternoon. The London post of Monday night

did not reach Worcester, Birmingham, or Norwich, till Wednesday morning, and Exeter on the Thursday morning. A letter from London to Glasgow, before 1788, was five days on the road. The letter-bags were carried by boys on horseback; and the robbery of the mail was, of course, so common an occurrence, that no safety whatever could be secured in the transmission of money. The highwayman was the great hero of the travelling of that day. But on the 2nd of August, 1784, the first mail-coach left London for Bristol; and from that evening, till the general establishment of the railway system, the mail was one of the wonders and glories of our country.

The stage-coaches followed the mails in the course of improvement. We remember them when they were not very particular about the pace; and four hours from Windsor to London was pretty well. To be sure, there was a quarter of an hour for breakfast at Longford, and another quarter of an hour for luncheon at Turnham-green; but it was a pleasant ride in days when men were not in a hurry. The pace of our now surviving stage-coaches is, for the first half-hour after the railway, a sort of impertinence. You feel you are crawling when you have mounted the ten-mile-an-hour tortoise that is to take you across the country from the station; but yet the driver presumes to talk of his cattle. Look at him. He has a load of responsibility put upon him which he is little able to bear. He *must* keep time. He dares not have a snack at the half-way-house; he has no messages to deliver; he sticks gloomily upon the box, while the horses are hurriedly changed; he sleeps not at nights, without dreaming of the whistle; he is dependent upon an absolute will; he has a cadaverous melancholy face, as if Time were beating him prematurely. Contrast him with Washington Irving's English coachman of 1820:—"He has commonly a broad, full face, curiously mottled with red, as if the blood had been forced by hard feeding into every vessel of the skin; he is swelled into jolly dimensions by frequent potations of malt liquors, and his bulk is still further increased by a multiplicity of coats, in which he is buried like a cauliflower, the upper one reaching to his heels. He wears a broad-brimmed, low-crowned hat; a huge roll of coloured handkerchief about his neck, knowingly knotted and tucked in at the bosom; and has in summer-time a large bouquet of flowers in his button-hole,—the present, most probably, of some enamoured country lass. His waistcoat is commonly of some bright colour, striped; and his small-clothes

extend far below the knees, to meet a pair of jockey-boots which reach about half-way up his legs." The portrait belongs to the archæology of England. A sedan, a hackney-coach, and a stuffed stage-coachman of the fat times, should be deposited in the rooms of the Antiquarian Society, while a specimen can be preserved in relic, or made out from description.

"There were twenty-nine military roads leading from Rome, some of which extended to the extreme parts of the empire, their total extent being, according to Bondelet, 52,964 Roman miles, or about 48,500 English miles." (*Tredgold on Railroads.*) We were beating the Romans in our own island, in comparative miles of stone and gravel, at the time when iron said, "Pave no more." In 1839, the turnpike-roads of England and Wales amounted to 21,962 miles, and in Scotland to 3,666 miles; while, in England and Wales, the other highways amounted to 104,772 miles. The turnpike-roads were maintained at a cost of a million pounds a year, and the parish highways at a cost of about twelve hundred thousand pounds. There were at that time nearly eight thousand toll-gates in England and Wales. There had been two thousand miles of turnpike-roads, and ten thousand miles of other highways, added to the number existing in 1814. But the improvements of all our roads during that period had been enormous. Science was brought to bear upon the turnpike lines. Common sense changed their form and re-organised their material. The most beautiful engineering was applied to raise valleys and lower hills. Mountains were crossed with ease; rivers were spanned over massive piers, or by bridges which hung in the air like fairy platforms. The names of McAdam and Telford became "household words;" and even parish surveyors, stimulated by example, took thought how to mend their ways.

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### THE RAILWAY.

We have had an enthusiast amongst us, who held that the words of the prophet Ezekiel, "And I looked, and behold, a whirlwind came out of the north, a great cloud, and a fire," were typical of railway locomotion. We meddle not with such dangerous interpretations. But one with no pretensions to prophecy gave us some of the poetical elements of THE RAILWAY, long before such matters had any existence except in the

fables of the Hindoo mythology. In 1810, Robert Southey, in his 'Curse of Kehama,' shadowed out a dark hint for the practical genius of Stephenson. Coleridge used to say that he anticipated many of Davy's experimental discoveries by *à priori* reasoning. Had Southey visions of the locomotive engine, when he described "the Car of Miracle," which

. . . . . "moved along,  
Instinct with motion; by what wondrous skill  
Compact, no human tongue could tell,  
Nor human wit devise?"

Did he contemplate the union of safety and speed, when he wrote,

"Steady and swift the self-moved chariot went?"

Did he prefigure the mighty tunnels of our day, when he said—

"Their way was through the adamantine rock :  
. . . . . on either side  
Its massive walls arose, and overhead  
Arch'd the long passage?"

Southey had no such visions: but he had somewhat of that universal sense called poetry, in this case adopted from the legends that have been told to the listening wonder of the oldest races of the world; and his imaginative creations were, in these particulars of mystic sublimity, the realities of this our age, falsely called prosaic. Wherever there is power, there is poetry. The tread of a mighty army is poetry; the rush of an engine that breaks down the barriers of mountains and rivers, and annihilates distance, is poetry. There is poetry in the wind that scatters, and the lightning that blasts; nor is there less poetry in the little bark that outrides the storm. There is poetry in the brave man who teaches his suffering fellows to put down oppression; there is poetry in the good man who stands up against the wildest buffets of fate with an equal mind. Poetry is not the exclusive property of any age, or any class, or any locality. Manchester has its poetry, as much as Loch Katrine. We admit that Roger North was not thinking of poetry when he described a Newcastle railway in 1680: "Another thing, that is remarkable, is their way-leaves; for when men have pieces of ground between the colliery and the river, they sell leave to lead coals over their ground; and so dear that the owner of a rood of ground will expect 20*l.* per annum for this leave. The manner of the carriage is by laying



rails of timber from the colliery down to the river, exactly straight and parallel; and bulky carts are made with four rowlets fitting these rails; whereby the carriage is so easy, that one horse will draw down four or five chaldron of coals, and is an immense benefit to the coal-merchant." Who would have thought that this contrivance would have led to no large results till a hundred and fifty years had passed away? Who could have believed that "the rails of timber, exactly straight and parallel," and "the bulky carts with four rowlets exactly fitting the rails," would have changed the face, and to a great degree the destinies, of the world?

When Jacquard, the inventor of the wonderful loom that bears his name, was arrested and carried to Paris, with his machine, Carnot, in the presence of Napoleon, roughly said to him, "Are you the man that pretends to do that *impossibility*—to tie a knot in a stretched string?" His compatriots of Lyons, the impossibility being surmounted, broke his machines in 1806, and raised a statue to his memory in 1840. All those who are in advance of public opinion must bear ridicule or persecution. In 1825, the *Quarterly Review* thus ridiculed the notion of certain engineers, Telford amongst the number, that a railway engine could go eighteen or twenty miles an hour: "The gross exaggerations of the powers of the locomotive steam engine, or, to speak plain English, the steam carriage, may delude for a time, but must end in the mortification of those concerned. . . . We should as soon expect the people of Woolwich to suffer themselves to be fired off upon one of Congreve's *ricochet* rockets, as trust themselves to the mercy of such a machine, *going at such a rate*." In that year, the common belief was that railways were altogether delusions and impositions. The Liverpool and Manchester Railway was opposed in Parliament with every form of invective. One member, in 1825, declared his opinion "that a railway could not enter into successful competition with a canal. Even with the best locomotive engine the average rate would be but three miles and a half per hour, which was slower than the canal conveyance." (*Hansard*, 2nd series, vol. iv. p. 853.) Another assertion, which Mr. Huskisson was obliged to meet doubtfully and apologetically, was, "that there were two or three canals which were sufficient for every purpose of commerce in the districts through which the railway was to pass." Let us be just to what we have been accustomed to decry as the dark ages. Let us be tolerant to those who imprisoned Galileo, and rewarded Columbus with chains. If there

be a reality in any discovery—a true thing and not a sham,—if there be strength, or utility, or beauty, in any work of mind, it will live and fructify, whatever critics, or orators, or inquisitors, or even kings, may do to crush it. And so it is with railways.

About the year 1767, iron plates were laid upon the wooden rails on a railway at the Colebrook Dale iron-works. Some time after the experiment at Colebrook Dale, cast-iron rails, with an upright flange, were brought into use at the colliery of the Duke of Norfolk, near Sheffield, in 1776. Originally they were fixed upon cross sleepers of wood, like those used to support wooden rails; but about the year 1793 blocks of stone were introduced as supports, instead of the wooden sleepers. Various inconveniences attendant on these *plate-railways* led to the use of *edge-railways*, which have now almost entirely superseded the previous form. The first edge-railway of any considerable extent was completed in 1801, for the conveyance of slate from the quarries of Lord Penrhyn. The decided advantages of edge-rails were so well appreciated by the coal-owners of Northumberland and Durham, that they were adopted extensively by them within a few years after the successful experiment at Penrhyn. Many successive varieties have been introduced in the form of the rails; but the greatest improvement was an invention, in 1820, of an efficient and cheap method of rolling iron bars suitable for rails and similar purposes. The fibrous texture of wrought-iron makes it far less likely to break, when subjected to concussion, than cast-iron, and the sectional form used is such as to render bending improbable.

The application of the steam-engine to the purposes of locomotion was suggested in one of the patents of Watt: but it does not appear that either he or any other inventor carried their ideas into practice until about 1802, when Messrs. Trevethick and Vivian patented a high-pressure engine, which, by its simplicity and compactness, was admirably adapted for locomotive purposes. Within a few years they built several carriages, one of which, at least, was for use on a common road. In 1805 they made some interesting experiments with a locomotive on a tramway near Merthyr Tydvil, and thereby proved the practicability of their plan. Engineers at first thought that the wheels would not hold or *bite* on the rails, without some other contrivances.

Shortly before the completion of the Liverpool and Manchester

Railway, the Directors decided that horse traction would be too slow for the requirements of the traffic; and they determined to try locomotives. They offered a premium of 500*l.* for the best to be produced, which would fulfil certain conditions, of which some were that it should not emit smoke, should draw three times its own weight at the rate of ten miles per hour, should be supported on springs, not exceeding six tons weight, or four tons and a half if on only four wheels, and should not cost more than 550*l.* The trial was fixed for October, 1829, when four steam locomotives were produced, one of which was withdrawn at the commencement of the experiment. Of the other three, the *Novelty*, by Messrs. Braithwaite and Ericsson, and the *Sans Pareil*, by Mr. Hackworth, failed in some of the conditions. The remaining engine, the *Rocket*, was constructed by Robert Stephenson and Mr. Booth, of the Liverpool and Manchester Railway, and succeeded in performing more than was stipulated for. The most marked improvement in Stephenson's locomotive was the use of a tubular boiler instead of a large flue.

From the opening of that railway, the success of the great system was at once decided. Nothing could check the spread of so vast an improvement; and we have since seen such a twenty years of commercial energy as the world never saw before.

In the laying down and construction of a railway, the engineer so adjusts his inclinations or *gradients* as to make the nearest practicable approach to a level, avoiding, if possible, any loss of power from undulations of surface, by making all the inclinations on one side of the summit, or highest point to be passed over, rise towards it, and all on the opposite side descend from it. Curves on a main line of railway being objectionable, the engineer so adjusts his line as to avoid them when possible, and to make those which are inevitable of as large a radius as circumstances will admit. The works of a railway consist chiefly of *tunneling, excavation, embankment, arching, viaducts, bridges*; concerning each of which a few words may be said.

*Tunnels* are, in general, the most formidable works, and the time and expense of forming them can be least accurately calculated, because unforeseen circumstances often arise to retard their progress. Being objectionable also on other accounts, tunnels are avoided as much as possible in the more recently-designed railways. *Excavations* of great depth and extent are of frequent occurrence where the railway passes through high ground, but not at such a depth from the surface as to require

a tunnel. The depth of cuttings is frequently from fifty to a hundred feet : and the slope of the sides depends on the nature of the rock or soil. *Embankments* are the artificial ridges of earth formed to support the railway on a higher level than the natural surface of the ground. Their dimensions are often fully commensurate with those of cuttings, from which their materials are mostly procured. In the ordinary mode of proceeding, an embankment is formed simultaneously with a cutting, the earth-waggons proceeding, filled from the excavation, along a temporary railway to the embankment, where they are tipped up to discharge their contents. *Arching* of almost every kind is more or less required in viaducts, bridges, culverts, and drains ; and simpler work in the retaining walls, station buildings, and other necessary erections. *Viaducts* of great magnitude are often executed for the purpose of crossing valleys at an elevation greater than could be conveniently obtained by embankment, and also for entering or passing through towns. They are usually of stone or brick, but sometimes of wood or iron. *Bridges* are required occasionally for crossing rivers, and very frequently at the intersection of roads, and as communications between severed property. They are formed of stone, brick, wood, iron, or combinations of two or more of these.

In order to obtain a firm dry foundation for the blocks or sleepers on which the rails rest, a layer or stratum of broken stone, technically called *ballast*, is spread over the road to the thickness of a foot or more, varying according to the construction adopted, and other circumstances. The rails used to be spiked down to stone blocks ; but it is found better either to rest them on sleepers placed at intervals, or on continuous timber bearings, as on the Great Western line. Mr. Barlow has recently invented cast-iron bearings for the rails, which are found to be a valuable improvement. He has also introduced a very broad wrought-iron rail, which requires no sleepers, the broad bottom of the rail being laid upon the ballast itself. The rails now used vary from 70 to 90 lbs. per yard. In the old colliery tramways, four feet, was not an uncommon width for the *gauge* of the rails ; but many lines were less. Some of the colliery railways of Northumberland are four feet eight inches and a half ; and from these the Stockton and Darlington, Liverpool and Manchester, and other lines, took their gauge. The advantage of uniformity has led most Companies to follow this example. The ordinary width being considered by him inconveniently limited, Mr. Brunel fixed upon seven feet as the gauge of the Great Western

and its tributary lines; and hence has arisen the late "battle of the gauges," which may be truly said to have cost the respective Companies millions of money, in law and legislation.

Wherever there is a uniform gauge, the *clearing-house system* is acted upon by the Railway Companies, to the obvious advantage of all parties. The principle of the system is, that passengers shall be booked through at all principal stations, and conveyed to their destination without change of carriage; that horses and cattle be in like manner carried through without change of conveyance, and goods without being shifted or re-assorted; that the Companies respectively shall pay a fixed rate per mile for such carriages and waggons, not their own property, as they may use, and a further sum per day, by way of fine or demurrage for detention, if kept beyond a prescribed length of time; and that all traffic accounts between the several Companies shall pass through the clearing-house.

The carriages used on railways we need not stop to describe; every one has had more or less opportunities of noticing the gradual improvements introduced. The wonder-working *locomotive*, however, must engage a little of our attention.

In a modern locomotive, the tubes through the boiler, for the passage of flame and heated air, are now always made of brass, which is found much more durable than copper. They vary in number in different engines from about ninety to a hundred and fifty or upwards, being frequently less than an inch and a half in diameter. The power of generating steam, which is the measure of efficiency in a locomotive engine, depends much upon judicious tubing. Boilers are frequently tubed to such an extent, that from four to six hundred square feet of heated metal is exposed to the water, in addition to the area of the fire-box itself. An important feature in a locomotive boiler is its security from bursting, because, as the tubes are much weaker than the external casing of the boiler, they are almost certain to give way first; and the bursting of one or two tubes is rarely productive of more serious consequence than extinguishing the fire, and thereby causing a gradual stoppage of the machine. In the old engines the cylinders were placed at the bottom of the smoke-box, and the machinery under the boiler; but there is a growing preference for those in which the cylinders are fixed outside the framing, and the power is conveyed to the wheels by external cranks and connecting-rods. The "long-boiler" engines of the narrow gauge are very large; but those of the Great Western Company are still more so. One

of the engines of this Company has about 1,750 square feet of heating surface in the boiler; has cylinders of 18 inches diameter, and 24 inches stroke; driving-wheels of 8 feet diameter; and two pair of bearing-wheels of 4 feet 6 inches in diameter. The total length is 24 feet; the distance between the supporting-wheels 16 feet; the weight of the engine alone, without fuel or water,  $28\frac{1}{2}$  tons, and of the tender, 10 tons; and the total weight of engine and tender, when loaded, about 56 tons. These engines, in the express train between London and Exeter, go at a speed, in some parts, of 60 miles an hour.

Small and light locomotives have been recently introduced, fitted for the traffic of branch lines.

Taking one line of railway with another, main lines with branch lines, and passenger traffic with goods traffic, it is found that one locomotive is required for about every two miles of railway; to work all the traffic effectively, and to have a sufficient reserve store for contingencies. We are thus enabled to form a rough estimate of the number of locomotives in the United Kingdom.

*Rope traction* on railways is becoming gradually abandoned; and the once highly extolled *Atmospheric traction* is only applied on two miles of the Dublin and Kingstown Railway.

The first railway established in this country as a distinct undertaking, and intended for public use, was the Surrey Iron Railway, the Company for which was incorporated in 1801. In the following twenty years only twenty new Railway Companies were incorporated; but the Stockton and Darlington Railway, the Act for which passed, after much opposition, in 1821, gave an impulse to this kind of enterprise. Between 1801 and 1840 there were 299 Acts passed relating to Railways. These sanctioned the construction of about 3,000 miles of railway; but many of these schemes were afterwards abandoned. Down to 1840 about 1,100 miles of railway were finished and open, and about 60,000,000*l.* had been expended on them. Between 1840 and 1850, railway legislation presented the following results:

Year.	Acts.	Length.	Year.	Acts.	Length.
1841	19	14 miles.	1847	184	1,663 miles.
1842	22	67 "	1848	83	300 "
1843	24	91 "	1849	35	50 ? "
1844	48	797 "	1850	36	50 ? "
1845	120	2,853 "			
1846	270	4,790 "			
				<hr/> 841	<hr/> 10,705

Taking the earlier Acts at 299, and mileage at 3,000, we have a total of 1,140 Acts of Parliament sanctioning railways, and about 13,700 miles of railway so sanctioned. This includes the lines which have been abandoned.

At the end of 1849 the length of railway open for traffic in the United Kingdom was 5,996 miles; at the end of 1850 it was 6,621 miles. This last amount is made up as follows :

England and Wales.....	5,132 miles.
Scotland .....	951    "
Ireland.....	538    "
	<hr/>
	6,621

The average receipts per mile in England and Wales, during 1850, for passengers was 1,218*l.*, and for goods, 1,110*l.*; this shows that the goods traffic has nearly reached the level of the passenger traffic. The passengers conveyed in the year ending June, 1850, were 66,840,175, who paid fares amounting to 6,465,575*l.* It is a curious fact, that the average paid by *all* passengers, of *all* classes, for *all* journeys, on *all* the railways, remains every year pretty nearly equal in amount; viz., two shillings per journey. This is much smaller than most persons would have expected, and it shows how much the short or local traffic preponderates over the long or through traffic. The goods traffic in the same twelve months brought 5,942,277*l.*; giving, with the passengers' receipts, the astonishing sum of 12,407,852*l.*—exceeding one million sterling per month.

Among foreign countries, America, Prussia, Germany, Belgium, and France, have not been slow to imitate the railway proceedings of England. On the first day of 1851, the United States had 8,797 miles of railway, which cost about 60,000,000*l.* On the continent of Europe the system is making rapid strides, but not comparable to that of the United States.

To attempt anything like a detailed view of the existing railway system of our land, would be to embarrass our readers with details which are constantly changing. Railways lead not now to marts of commerce alone: they take us amongst mountains and lakes, the margins of the broad sea, and the banks of the smiling rivers. John Wilson—a name never to be uttered by the lover of nature and natural things without a grateful homage—tells us, in his beautiful lines in a 'Highland Glen:'

"Yea! long as Nature's humblest child  
Hath kept her temple undefiled  
By sinful sacrifice,  
Earth's fairest scenes are all his own,  
He is a monarch, and his throne  
Is built amongst the skies."

It is for the humblest children of Nature that we especially rejoice, when "Earth's fairest scenes" are for the first time opened to their view, by the marvellous inventions of our own age. The magnificence of the railway system presents itself to our minds in a dreamy vastness that forbids any systematic attempt to follow it out to its ultimate tendencies. View it in connection with the arrangements of the Post-office. "Ride for your life—haste, haste, post-haste!"—were the commands of ambitious peers and crafty ministers in the days of Elizabeth, to the unhappy courier who was to post from London to Edinburgh. Onward he went, through miry ways and over trackless commons,—sometimes dashing up to his saddle-bows through a ford swollen by mountain rains—sometimes bewildered in the mists of the trackless moorlands. As he approaches the borders new terrors await him. He rides in the dim morning twilight, with his ears alive to every sound. He fancies that the tread of horses and of cattle is at hand. He dares not hide himself, for he would be mistaken for a spy. He rides boldly on into the troop of marchers who are returning from their foray; and, to his surprise, is permitted to escape, after he has been saluted with a few words of opprobrium, and a snatch of the ballad of Johnnie Armstrong. At last he reaches "Edina, Scotia's darling seat," after a perilous journey of five days. His dispatches are brought forth from their hiding-place;—the great men meet and deliberate;—and after a tarrying of a day or two, the express has to face again the same rough road. Take the Post-office arrangements between London and Edinburgh, and mark what they now do for the humblest in the land. We have somewhere seen it recorded, that the mail-bag from London to Edinburgh once arrived with a single letter. The penny co-operation of thousands now places a ton of northern letters in a carriage at Euston-square, at nine at night. Away rushes the mighty train by hill and champaign. The herds in the pastures heed not its accustomed thunder;—the villagers sleep on in defiance of the whistle. Ever and anon a bag is dropped at some solitary station; or there is a short parley at the more important stations of city and town.



The passengers slumber: or, looking forth over the moon-lit country, sometimes trace the silver thread of a gentle river, or the lurid glare of a smoking furnace. Onward it sweeps, till the morning breaks, and the solemn towers of York are gilded with the first sunbeam. A short pause, and away for the Border. The Tweed is crossed by a mighty bridge at noon, and then on to Edinburgh. In seventeen hours—with absolute certainty—the letter that costs one penny is transmitted to its destination in a seventh of the time, and at a seven-thousandth part of the cost, of the express that once bore the mandates of the great ones of the earth. It is a lesson for the feebleness of individual pride to take to its heart, and think how many things which solitary man still boasts of as his exclusive own will crumble into nothingness before the power of association.

Let us set out on the same journey by the morning mail, at half-past nine. We breakfast in the suburbs of the capital with the cheerfulness of the domestic hearth around us; a long journey is before us; there is a slight pang when we feel that an inexorable power will that same evening separate us by some hundred miles from those we love. It may be a childish feeling in the eyes of the young; but we who have lived in the sober days of seven miles an hour cannot quite throw it off. Happy is it that the identical power which so suddenly interposes its almost impossible distance between us and our household sympathies, brings its own wondrous consolations.—We have accomplished the four hundred and twenty-six miles; have slept; have breakfasted; have transacted business, within twenty-four hours. Twelve hours after we left our home a winged messenger came travelling towards us, to make us feel that we were not alone,—that strange faces might look upon us, but that “the old familiar faces” were still greeting us wherever we moved. We know that they are close around us, when no distance can separate our written thoughts even for a day. A single word of home news, a single touch of home feeling, holds us together. We *drag* not at “each remove a lengthening chain” of anxiety and “hope deferred.” Separation—real separation of thought and interest,—is not to be spoken of in a land, where science and commercial energy have rendered the all-penetrating influence of the Post rapid as the winds, certain as the alternations of light and darkness.

### THE ELECTRIC TELEGRAPH.

Who was the happy suggestor of the Electric Telegraph? To this day it is a disputed point; and it is likely to remain so: for modest hints as to the power of communicating signals by this agency may have been thrown out before any formal proposals for that purpose were made public. Many slight suggestions, experiments, and contrivances, having some such object as this in view, were made in times long gone by; but it was about fourteen years ago that its practicability as a system was made apparent.

To the little Blackwall Railway is due the honour of being the scene of this manifestation, so far as England is concerned. At the time that Messrs. Wheatstone and Cooke patented their Electric Telegraph in 1837, this railway was being constructed: and the peculiar system of rope-traction, adopted for the accommodation of intermediate stations, rendered some efficient telegraphic system necessary. The new agent, the electro-telegraph, was employed, and most admirably did it do its work. It kept up a communication between the two termini and half a dozen intermediate stations, and provided for the transmission of signals from every station to every other, at intervals of a quarter of an hour throughout the day. The rope has given way to locomotives; but the telegraph has been growing in importance year by year.

The same inventors who introduced the first telegraph have improved it by subsequent patents, and have (among other things) devised a mode by which it may print its own indications. In the meantime foreign nations were not blind to the wonders thus gradually developed: Professor Morse in America, and Dr. Steinheil and others in Germany, devised forms of electric telegraphs in which much novelty and ingenuity were displayed.

The first experimenters employed a return wire to complete the galvanic circuit, but it has since been found that this may be dispensed with. In 1842, Mr. Bain conducted an experiment at the Serpentine, in which he made the water itself perform the part of the return wire. Professor Wheatstone, about the same time, laid down a telegraphic wire from King's College to the Shot Tower nearly opposite, and completed the circuit by the water of the Thames.

Long before the Electric Telegraph Company was established, public attention had been attracted to the marvels attained in

quick communication of intelligence. The Queen's speech was printed at Southampton within two hours after its delivery in London; the substance of it having been transmitted letter by letter. A murderer whose crime had been committed at Salt Hill, was captured in a railway carriage at Paddington, the news of his crime having travelled quicker than even railway travelling could carry him. The dread messenger, with lightning speed, passed silently through the wire suspended near him, and overtook him in his attempted escape from justice. Games of chess were played by persons a hundred miles apart: each move being signalled by the telegraph. A deserter from the United States' army, who had doubled his offence by robbery, was captured in a similar way on the Washington and Baltimore Railway. A physician at Lockport corresponded by similar agency with a patient at Buffalo, many miles distant: the one transmitting an account of his symptoms, the other forwarding his advice and prescription. But the oddest of all was a marriage ceremony, performed between a bridegroom at New York and a bride at Boston, the questions and answers and declarations and pledges being transmitted per telegraph; the match being a stolen one, however, the validity of the ceremony was afterwards disputed in a court of law.

Dr. Steinheil, Professor Morse, and Mr. Davy, all contrived electric telegraphs which would write or print their own indications, and this even very early in the history of the art. But from various practical difficulties, the registering apparatus has not been so much employed as was at first anticipated. Professor Morse made his instrument write with a pencil, in arbitrary characters formed of lines and angles; but in a later modification, the characters were made by indentations on the paper with a blunt instrument. Mr. Davy contrived to produce a series of blue lines on white paper, as a set of symbols.

It would be no easy matter to trace the rapid succession of improvements and novelties in this wonderful apparatus. The wits of men were sharpened both by the beauty and the value of this new intermedium of thought; and we find a continued stream of inventions, some patented and some not. Mr. Wheatstone patented a third modification in 1840, supplemental to those of 1837 and 1838. In 1841, Mr. Bain brought forward his electric telegraph, with a printing apparatus, for recording the results, of ordinary inked types; and in 1843, he applied various modifications to the system. In 1843, Mr. Cooke introduced the mode of suspending the wires on posts, which has

since been so generally adopted on English railways. A year or two after this, Mr. Bain devised a new form of registering or writing telegraph, in which the written copy produced at one end of the wire is an exact counterpart, or fac-simile of that transmitted from the other. Then came various improvements by Messrs. Brett and Little, in almost every part of the apparatus; by Messrs. Henley and Forster, in the details of the magnetic machine; by Mr. Ricardo (Chairman of the Electric Telegraph Society), in the mode of insulating and suspending the wires; by Mr. Swan, in the acid liquid employed in the batteries; by Dr. Bachoffner, chiefly in the indications by means of a dial; by Mr. Bakewell, in his very ingenious transmitting apparatus; by Mr. Roe, in the mode of using metallic types; by Mr. Bain, again (who, in 1849 attained the means of printing one thousand letters per minute by his electric telegraph); by M. Dujardin, in the chemical printing arrangements; by M. Pulvermacher, in various parts of the apparatus; by Mr. Highton, who sketched a multiplicity of minor changes; by Messrs. Brown and Williams, in the adjustment of the electro-magnetic machine; by Mr. Siemens, in the mechanical details of the magnets and the printing-types. Indeed, considering the expense of a patent, it is astonishing what a number have been taken out on this subject; for most in the above list are patented, and only a few out of the number are likely to bring golden results to the patentees.

The Electric Telegraph Company, mentioned in the preceding paragraph, was formed in 1846. It has purchased most of the patents of Messrs. Wheatstone and Cooke, and of Mr. Bain; and is, up to the present time, the only body by whom electric telegraphy has been carried on to any great extent in this country. The central office is in Lothbury, from which point wires extend to the various metropolitan railway termini; and from those termini the wires ramify to almost every part of England and Scotland, wherever a railway exists, always excepting the mighty "broad gauge," which seems to have a will and a way of its own in everything, and to distrust imitation of its narrow gauge neighbours. The broad gauge is, however, at length yielding to the electric pressure from without; for orders have lately been issued for laying down the telegraph on that important system of railways. At for the *modus operandi* at the various telegraph offices, most persons have seen, or heard, or read something concerning it. A person takes a written message to the office; it is dissected into letters, and

transmitted piecemeal; it is received at the other end of the wire, and is built up again into the form of a message; and this message is conveyed to the required quarter. Generally speaking, the messages relate to matters of business, making inquiries, transmitting news, &c.; but they may obviously relate to other matters. A little while ago, a military officer had to attend a royal banquet in London; he came from the north, per railway, but found that he had left his regimentals behind him. He was for hastening back at express speed, to fetch the indispensable symbols of his rank, but was told that an electric message would save him all the labour, half the time, and nearly all the expense; and the glittering attire was sent up to him by the next train.

The Telegraph Company, after an existence of fourteen years, has recently applied for an extension of the monopoly rights, on the ground of the large sums paid in purchase of patents; but this application has been refused, and a new Company established by Act of Parliament. Hostilities have not yet actually commenced between the rival powers, but are pretty sure to arise ere long. The Directors state that sufficient capital has been provided by shareholders to construct a thousand miles of telegraph on the new system, which is said by its advocates (as advocates always say) to be much superior to the old. Negotiations are on foot with the various Railway Companies, each telegraph company seeking to outbid the other in offers made for the use of the railway lines,—the profits to be derived from letting out the use of the telegraph for commercial purposes. If this competition do not degenerate into recklessness, there may be enough financial success for both, and the public may be well served; but the difficulty consists in maintaining the distinction between wholesome and ruinous competition.

But the *Submarine* Telegraph is that which now most rivets public attention: it is so marvellous, and will be of such incalculable advantage if successful. Where and when the subject was first broached, we do not know; but in 1844, a Jersey newspaper threw out a suggestion that a submarine telegraph might possibly be laid down from that island to Southampton. In 1845, an American newspaper,—the country for daring “go-a-head” journals,—gave a string of calculations to show that an ocean telegraph from England to America was practicable. This was a matter in which the Admiralty felt an interest; and partly for their immediate uses, partly to test the larger pro-

ject, they caused a submarine telegraph to be laid down from Gosport to Portsmouth, across Portsmouth Harbour. The perfect success of this project made a great impression on the public mind; and hence projectors became abundant,—Dover to Calais, Holyhead to Dublin, Marseilles to Algeria, England to America,—nothing came amiss to these oceanic telegraphers. In the beginning of 1849 the Electric Telegraph Company laid down wires from their office at Hull to the new railway station, and passed it at a depth of twenty feet beneath the water through one of the docks; this was a submarine (or, at least, subaqueous) telegraph on a small scale, and succeeded perfectly well. A “Dublin and Holyhead Submarine Electric Telegraph Company” was projected and advertised in the same year; but shareholders do not appear to have been forthcoming. In the same year, also, the French Government granted a privilege to Mr. Jacob Brett to lay down a submarine telegraph from France to England; the Government to derive certain advantages from it, and the contractor to have the commercial monopoly of the system for ten years. One of the conditions of the contract is said to have been, that by the aid of a single wire, and of an observer on each shore, the apparatus should be capable of printing on paper, in clear Roman type, 100 messages of 15 words each, in 100 consecutive minutes.

It was a day to be remembered, when this thread of thought (if it may so be termed) was first stretched across the Channel from England to France. On the 28th of August, 1850, this was actually effected; and although circumstances have retarded the completion of the system, the soundness of the principle was abundantly tested. The wire employed was of copper, encased in gutta percha; about thirty miles of such wire was coiled round a large cylinder in the steamer *Goliath*. One end of the wire being secured on shore at Dover, the steamer slowly voyaged across the Channel to Cape Grisnez, a point on the French coast midway between Calais and Boulogne; the wire uncoiled as the vessel proceeded, and sank to the bottom of the sea, where it was kept down by leaden weights placed at intervals. Onward the steamer proceeded, while those on board kept up a fire of telegraphic questions and answers with the friends left behind at Dover; a strange defiance of distance and of waves. At length the vessel reached the French coast, and the line was carried up a cliff, where it was placed in connection with a battery. Complimentary messages were then transmitted between England and France; and thus was achieved one of

the greatest triumphs of science in its applications to the wants of society. It is true that the wire was broken by an accident within a week afterwards; it is true that a whole year has been spent in resuscitating the enterprize; but we have recently seen that there is energy afloat to surmount all the difficulties. A new wire, or rather rope, has been formed of formidable dimensions. In the first place, four copper wires were prepared, each twenty-four miles long; each wire was enveloped in a double coating of gutta percha, and the whole were then bound round with yarn dipped in tar and tallow. Ten iron wires were then twisted round this core, to form a rope. The monster rope thus formed weighed 180 tons. On September 27, 1851, this ponderous wire told its own tale, by bringing over a telegraphic message from the French coast to England—  
not without a mishap, however, which has caused a little delay.

In the beginning of 1851, a paragraph appeared in *Galignani*, which seems to show that Mr. Bain's system is working more energetically in that country than our English system. The French Government, preparatory to purchasing Mr. Bain's rights so far as regards that country, caused a trial to be made on the Paris and Tours Railway. A signal was made from the ministry to Tours, desiring that a despatch might be forwarded to Paris. This communication, and the answer from Tours, a distance of about 180 English miles, announcing that a despatch would be sent immediately, took one minute and a quarter. A long despatch, containing 466 words, equal to about fifty lines in the ordinary print of a newspaper, was then received. The time occupied in the transmission of this long despatch was only two minutes and a quarter. It was read off by one of the assistants, and written down by another at his dictation, in thirteen minutes. The signs were read with the same facility and rapidity as another person would read the ordinary print of a book. Unless some error has crept in here, such a performance is most marvellous.

Great as may be deemed the length of electric telegraph in England (for it is adopted on most of the narrow-gauge railways), it is greatly exceeded by that of America, where it is measured by thousands of miles; some on Morse's system, some on that of Bain. Even Mexico, poor shattered Mexico, has spirit enough to have lately commenced a line of telegraph from the Capital to Vera Cruz on the one side, and to Acapulco on the other; thereby stretching a wire across the country from ocean to ocean. On the continent of Europe, Siemens and

Halske's system is adopted in the greater part of Germany ; it combines a writing and printing power with that of telegraphing, exhibiting great ingenuity. In Austria, where the railways are creeping towards the Adriatic in one direction, and towards eastern Europe in another, the electric telegraph appears as their companion ; and so it is in such other parts of Europe as have begun to adopt the railway system ; nay more, telegraphs are, in some continental countries, laid down beneath the common roads without waiting for railways. Thus it proceeds, step by step, across Europe. Lord Palmerston made a pleasant prediction, or a joke which may turn out to be a prediction, at a public dinner at Southampton, where he said that the day may come when, if the minister were asked in the House of Commons whether war had broken out in India, he might answer, "Wait a minute; I will telegraph the Governor-general, and ascertain."

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### THE SAIL AND THE STEAMER.

If there is one truth which, more than another, would be admitted in these days of steam, it is, that modern arrangements for travelling economise time. Whether we compare the old Gravesend tilt-boat with the modern 'Jupiter' or 'Sapphire'—the old labouring row-boats with the Greenwich and Woolwich steamers—the Leith smack with the Edinburgh steamer—the old Ostend or Calais boats with the present Ostend or Boulogne railway-packets—the Clyde or Forth boats of past days with the Clyde or Forth steamers of the present—the American, or Mediterranean, or East India ships with the fine steamers which now leave our shores for those parts—in whichever way we look, the same acceleration is exhibited. It seems tolerably clear that *saving of time* is the most powerful of the circumstances which have led to the preference of new modes of voyaging over the old. We propose to take a rapid glance at some of the most prominent exemplifications of this contrast. Let us begin with our enterprising Glasgow neighbours.

#### THE CLYDE.

If we look at the Clyde in regard to its actual size, we must deem it one of the most extraordinary rivers in existence. On



walking along the banks, from Glasgow towards Bowling, it is scarcely possible to believe that *such* a river should be an artery for so much shipping. It is so narrow, for a great part of the distance from Glasgow to Greenock, that nothing but the most energetic measures could have fitted it for the reception of large and abundant shipping. Steamers and Clyde improvements have gone on simultaneously; the steps of advance being highly interesting in a commercial point of view. It has been well observed, that the Clyde not only "bears along ships of heavy burden and deep draught of water, and is plentifully dotted with yawls and wherries, but is kept in constant foaming agitation by large steam-ships bearing heavy cargoes from the shores of England and Ireland, by numerous coasting steam-vessels careering over its surface with live-freights of human beings, and by steam tug-boats dragging behind them trains of sailing craft too unwieldy to pilot their own way within its narrow channel."

The traffic of Glasgow, exactly two centuries ago, was thus described in a letter written by Commissioner Tucket, a Government agent, in 1651:—"Nearly all the inhabitants are traders; some to Ireland with small smiddy coals, in open boats, from four to ten tons, from whence they bring hoops, rings, barrel-staves, meal, oats, and butter; some to France, with plaiding, coals, and herrings; from which the return is salt, pepper, raisins, and prunes; some to Norway, for timber. There hath likewise been some that ventured as far as Barbadoes; but the loss which they sustained, by being obliged to come home late in the year, has made them discontinue going there any more. The mercantile genius of the people is strong, *if they were not checked and kept under by the shallowness of their river*, every day more and more increasing and filling up; so that no vessel of any burden can come up nearer the town than fourteen miles, where they must unlade and send up their timber in rafts, and all other commodities by three or four tons of goods at a time, in small cobbles or boats, of three, four, or five, and none above six tons a boat." Here we have a key to much of the energy of the "Glasgow folk:" their river was very shallow, and they could not embark in an extensive foreign trade without adopting some remedial measures. As we are not here writing a history or a description of Glasgow, it will suffice to say, that by constructing a harbour at Port Glasgow, lower down the Clyde; by dredging the river from end to end; by straightening the banks, and making quays and

jetties; by deepening the bed so considerably as to enable vessels drawing seventeen feet of water to come up to the city itself; and by laying out basins and piers—the Glasgow merchants have wrought a wondrous change: only vessels of thirty or forty tons could approach Glasgow at the beginning of the present century; whereas now the busy Broomielaw exhibits its ships of 800 or 1000 tons burden.

Meanwhile the genius of James Watt has been doing its work. In the present century, when steam navigation opened a new era in the modes of travelling, Glasgow and the neighbourhood possessed all the elements necessary for the establishment of such a system: she had steam-engines and steam-engine factories—‘black band’ to yield iron, and iron works to cast or roll it—manufactures to export, and a market for the return cargo—pleasant lochs and isles to visit by steam trips, and a population able and willing to visit them. It was in 1812 that the little ‘Comet,’ made by Wood and Co., of Port Glasgow, and brought out by Henry Bell, first glided down the Clyde by steam-power, after having been tried in the previous year on the Forth. She made five miles an hour against a head wind; and *ought* to have brought her ingenious projector both fortune and fame—fame, to hardly an adequate extent, has come since his death; but fortune never reached him.

For five or six years the Clyde was the scene of experimental steam-trips, before the Glasgow people would venture out to sea by such guidance; but in 1818, David Napier decided this matter in the most efficient way. “It is to this gentleman,” says Mr. Scott Russell, “that Great Britain owes the introduction of deep-sea communication by steam-vessels, and the establishment of Post-office steam-packets. In 1818, Mr. Napier established between Greenock and Belfast a regular steam communication by means of the ‘Rob Roy,’—a vessel built by Mr. William Denny, of Dumbarton, of about 90 tons burden, and 30-horse power. For two winters she plied with perfect regularity and success between these ports, and was afterwards transferred to the English Channel, to serve as a packet-boat between Dover and Calais. Having thus ventured into the open sea, Mr. Napier was not slow in extending his range. Soon after Messrs. Wood built for him the ‘Talbot,’ of 120 tons, with two of Mr. Napier’s engines, each of 30-horse power. This vessel was in all respects the most perfect of her day, and was formed on a model which was long in being surpassed. She was the first vessel that plied between Holy-

head and Dublin. About the same time he established the line of steam-ship between the stations of Liverpool, Greenock, and Glasgow."

How vast has been the progress since then—little over thirty years ago! The Clyde, the Mersey, and the Thames, have worthily kept pace with each other. It is a fact always observable, that there are ship-building establishments and engineering works at or near the spots where steam navigation has made the most rapid strides; and it is not difficult to see that such are almost necessary concomitants. The engineering establishments of Glasgow, especially connected with steamships, are among the most interesting of its industrial features. Those of the Napiers, especially, are notable for the fine ships for which they have furnished engines. The 'British Queen,' the 'Britannia,' the 'Acadia,' the 'Caledonia,' the 'Asia,' and others, whose names have become almost household words with those who read about transatlantic steaming—all had their engines from the celebrated 'Vulcan Foundry' at Glasgow. The making of iron steam-boats, too, has been taken up with great energy; and the same firm now frequently makes the boat or ship itself, and the engines which are to be put into it.

It would be no easy matter to name all the steam routes of which Glasgow is the starting-point. A writer in the *Gazetteer of Scotland* truly remarks, that "The steam-boat quay of Glasgow, especially during the summer months, presents one of the most animated scenes which it is possible to conceive. River-boats, of beautiful construction, leave the Broomielaw every hour from morning till night; and some of them possess such power of steam, that they career along the Clyde at the rate of from twelve to fourteen miles an hour. The larger boats, especially those plying between Liverpool and Glasgow, are in reality floating palaces, having cabins fitted up at vast expense, and with every regard to grace and architectural beauty."

The pleasure trips on the Clyde—one of the features introduced by steam-boats—are remarkable for their cheapness, and for the varied scenery to which they introduce the tourist. He sooner reaches fine scenery than the Thames tourist to Gravesend or Margate. Six o'clock in the morning is not an uncommon time for Glasgow tourists to start for a day down the Clyde and up to Loch Lomond. A fare of sixpence for a deck-passenger (and who cares to be *below* deck in a fine river trip?) will take him down the Clyde. First he passes the busy

and smoking engineering works. Next he arrives so far in the suburbs, that the villas of the citizens begin to peep out on either bank—forming a sort of half-way, an amalgamation, a compromise between town and country. Then, after passing the little obelisk erected to the memory of Henry Bell, he comes in sight of the rock of Dumbarton, where he is taken by a row-boat a little way up the river Leven, if the steamer is bound to any place lower down the Clyde; but some of the steamers go up the Leven to Dumbarton town. Here steaming is at an end for the present; but after an inland ride of four or five miles, the tourist reaches the southern end of Loch Lomond, where another steamer receives him, and takes him to all the ‘lions’ on both shores of the lake; or the Dumbartonshire railway takes him from Bowling to Balloch, where he meets the Loch Lomond steamer. This kind of lake-touring has become highly relished in Scotland. About ten years ago a small steamer was established on Loch Katrine, near the Trosachs: and many of the lochs, or rather inlets of the sea—such as Loch Goyl, Loch Fyne, Loch Long, Loch Gare, &c., westward of Glasgow, and near the mouth of the Clyde, are visited by pleasure tourists per steam-boat. Many of the Glasgow citizens have country residences at Helensburgh, Rothesay, and other pleasant spots on the islands and shores of the Firth of Clyde; and boat-loads of such travellers are conveyed down the river by steam every afternoon:

They who had nought of verdant freshness seen  
But suburb orchards choked with coleworts green,  
Now, seated at their ease, may glide along,  
Loch Lomond's fair and fairy isles among;  
Where bushy promontories fondly peep  
At their own beauty in the nether deep,  
O'er drooping birch and rowan red, that lave  
Their fragrant branches in the glassy wave;  
They who on higher objects scarce have counted  
Than church-spire with its gilded vane surmounted,  
May view within their near distinctive ken  
The rocky summits of the lofty Ben;  
Or see his purple shoulders darkly lower  
Through the dim drapery of a summer shower.

JOANNA BAILLIE.

There are daily (and in some cases almost hourly) steam-boat conveyances to Greenock and Gourock, to Kilm and Dunoon, to Rothesay and Largs and Millport, to Ardrishaig, to Dumbarton, to Gareloch and Helensburgh and Roseneath and Tarbert. Communications somewhat less frequent are kept up with Bro-

dick, Inverary, Oban, Portree, Islay, Port Ellen, &c. Others, again, northward to the rugged districts of Stornaway; southward to Liverpool; and across the Channel to Londonderry, Belfast, and Dublin. The Ayrshire Railway, too, has given rise, in conjunction with the Preston and Wyre Railway, to a new steam-boat route between Ardrossan and Fleetwood, which, however, fights feebly against the Liverpool route. The gigantic schemes of the Caledonian and the Ayrshire Railway Companies, in and near Glasgow, might seem to threaten these steam-boat enterprises; were it not that experience has shown, both in the Thames and elsewhere, that horse-conveyances on land, and steam-conveyances on water, are actually increased, directly or indirectly, by the spread of railways. A steamer has no land to buy, nor "maintenance of way" to pay for: it carries its capital on its back, so to speak, and is able to pay its expenses at comparatively low charges.

If anything were wanting to show the activity of Scotland in availing herself of the steam-boat power, which Glasgow and the Clyde were the first to develope, it would be shown in the fact, recorded by Mr. Porter in his 'Progress of the Nation,' that, in 1844, Scotland owned more steamers than the whole of France, although containing only about one-fifteenth part as many inhabitants!

Of the recent energetic proceedings of Glasgow, in respect to transatlantic steaming, a little is said in another part of this volume.

It is a very remarkable circumstance, in connection with the voyage from Glasgow to London, that there are two totally different routes, almost exactly equal in length; one round Scotland and the east of England; and one round the west and south of England. Each of these distances is more than eight hundred miles—the northern being, if anything, somewhat the shorter. The railway distance is about four hundred. Some few months ago a bold enterprise was determined on—the periodical running of a steamer from Glasgow to London, as a means of conveying Glasgow goods to the metropolis without the delay of transhipment. The departures were to be twice a month, and the north or south route selected according to the weather. The first voyage was made by a fine screw steamer, the 'European;' and it was expected that three days and a half would suffice for the voyage. It is a fair commercial question, to be decided by adequate trial, whether eight hundred miles of screw-steaming can compete with four hundred of rail-

way goods traffic, especially now that the railway companies have so notably lowered their tariff of goods' rates.

Let us next cross the island, and look at steam-boat operations at the ports of the east coast. On our way we meet with a canal—the Firth and Clyde Canal—which has itself exhibited the march of improvement in respect to boat-traction. Were it not that the extraordinary rise of railway-travelling has thrown canal-transit of all kinds into the shade, we should probably ere this have seen established some very interesting results in reference to the attainment of high-speed in water-conveyance; but canal enterprise is much discouraged just now; and many of the best canals are either being bought up by railway companies, or converted into railways.

#### THE PORTS OF THE EAST COAST.

If we look at the Firth of Forth—that river-mouth which separates Edinburgh from Fifeshire—we see that it presents a serious obstacle to the maintenance of coach communication between Edinburgh on the one hand, and Perth, Dundee, and Aberdeen on the other. Not till we arrive at Stirling do we find the Forth sufficiently narrow to be crossed by a bridge; and this circumstance may have led the Edinburgh and Leith people to steam-boat enterprises which they might not otherwise have thought of. At Grangemouth, where the Forth and Clyde Canal communicates with it, the Firth is more than two miles wide at high water. At Queensferry, where it is crossed by ferry steamers, it is much narrower; but at Burntisland, where a new ferry has been established from Granton Pier, the width is five or six miles.

The passage over the Forth at Queensferry, from being the shortest that can be made anywhere near Edinburgh, has for many centuries been regarded as one of importance. So early as the twelfth century the rights of this ferry were given to the monks of Dunfermline; and the possession of the right often gave rise to warm contests in after ages. The ferry is in the hands of trustees, who regulate fares, times, and other details.

The boatmen of North Queensferry, on the Fifeshire side of the Forth, appear to have been a peculiar class of men. Mercer, in his 'History of Dunfermline, while speaking of these boatmen in past times, says: "The inhabitants of North Queensferry consisted from time immemorial of operative boatmen, without any admixture of strangers. They held their feu under the Marquis of Tweeddale, as successor of the abbots of

Dunfermline; and they have always held, from generation to generation, the ferry as a sort of property or inheritance. On the evening of every Saturday the earnings of the week were collected into a heap; one-fortieth part of the whole was set apart for the proprietors of the passage; and the remainder was divided into shares, called *deals*, according to the number of persons entitled to a share of it. One full deal was allotted to every man of mature age who had laboured during that week as a boatman, whether he acted as master or mariner, or in a great boat, or in a yawl. Next the aged boatman, who had become unfit for labour, received half a deal, or half the sum allotted to an acting boatman. Boys employed in the boats received shares proportioned to their age. A small sum was also set aside for a schoolmaster, and for the widows of decayed boatmen. Nobody became a boatman in this ferry unless by succession, and that right was always understood to be limited to the first generation. The children of those who had emigrated, or were born elsewhere, had no connection with this ferry; but, on the other hand, if the son of a boatman found himself unfortunate in the world, he was always entitled to return, to enter into one of the boats, and to take a share of the provision which formed the estate of the community in which he was born. That community always consisted of nearly the same number of persons. About forty men acted in the boats, and received the full deal, as sailors of mature age. The whole community, including these and the old men and boys, and the women of every age, amounted to about two hundred individuals."

This ferry has not been an inactive witness of the giant strides of steam navigation. Although the Forth is here only two miles in width, there are abundant tales and narratives in Scotch books, illustrative of the delays often attending the passage. In rough weather the ferry has occasionally been impassable for days together; and even in days when the passage could be made, passengers have been beaten about in an open boat for four hours in the act of crossing. Another passage, lower down the Forth, from Leith to Pettycur, is a distance of about seven miles; and for this distance four or five hours were not considered an unreasonable time in past days. One tourist relates that, about forty years ago, he embarked in a small sailing-boat at Pettycur, to cross over to Leith; and that after being on board *fourteen hours*, he was landed at Fisherrow harbour at one in the morning, six miles from Leith, the boatmen not being enabled to approach Leith Harbour.

The first meeting of Jonathan Oldbuck and Lovel, in Sir Walter Scott's 'Antiquary,' takes place in the course of the short coach journey from Edinburgh to Queensferry, on the way to the ferry; but as the laughable incidents relate rather to the coach than to the ferry, we may pass it over. In an autobiography of Alexander Wilson, a sort of half-poet, half-pedlar, who lived in Scotland about fifty years ago, is the following notice of the ferry passage from Kinghorn to Leith across the Forth, just opposite the last-named town:—"In a large boat, the passenger pays sixpence; in a pinnace, which is most convenient in a smooth sea, tenpence. The inhabitants are almost all boatmen, and their whole commerce being with strangers, whom perhaps they may never see again, makes them avaricious, and always on the catch. If a stranger come to town at night, intending to go over next morning, he is taken into a lodging. One boatman comes in, sits down, promises to call you in the morning, assists you to circulate the liquor, and, after a great deal of loquacity, departs. In a little while another enters, and informs you that the fellow who has just now left you goes not over at all; but that *he* goes, and that for a glass of gin he will awake you and take you along with him. Willing to be up in time, you generously treat him. According to promise you are awakened in the morning, and assured that you have time enough to take breakfast; in the middle of which hoarse roarings alarm you that the boat is just going off. You start off, call for your bill—the landlord appears, charges you like a gentleman—there is no time for scrupling—you are hurried away by the boatman on the one hand, and genteelly plundered by the landlord on the other, who pockets his money, and bids you haste lest you lose your passage. Perhaps, after all, when you get on board, you are detained an hour or more by the sailors waiting for more passengers."

The next time the reader has to travel six or seven miles, let him picture to himself "a boatman coming in, sitting down, and promising to call you in the morning," and all the other features of Alexander Wilson's narration, and then thank his stars that we live in steaming days. Instead of the uncertain Queensferry-boat passage, there are now snug steamers every half-hour, which perform the distance in about a quarter of an hour. Instead of the tedious passage from Pettycur, or from Kinghorn to Leith by boat, we have now rapid steamers from Burntisland to Granton, performing the distance in little more than half-an-hour. This Granton Pier itself is a mark and



symbol of the age we live in. It belongs to the Duke of Buccleuch; while the opposite pier of Burntisland belongs to another wealthy Scotch proprietor, Sir John Gladstone. The two together have made a commercial speculation of the piers, the ferry, and the steamers, and seem likely to benefit themselves as well as the travelling public. The Edinburgh, Perth, and Dundee Railway Company (formerly the Edinburgh and Northern), have purchased from the two proprietors just named the Granton and Burntisland ferry, and the piers and other accessories belonging to it, for a sum very little short of one hundred thousand pounds. Here again is an instance in which railways, instead of ruining steamers, are friendly to them; for the Company have established the best possible steam-boat conveyance from pier to pier, in connection with railways at both ends, as the only means of competing successfully with the Scottish Central Railway, which crosses the Forth by a bridge at Stirling, without the necessity of any ferry at all. Besides the mere crossing of the Forth, there are now numerous steam-boats, which trip up the river to Stirling and back at very low fares.

The steam conveyances, northward from the Forth to the Tay and the Dee, and southward to the Tweed, the Tyne, the Humber, and the Thames, have effected vast improvements, both in the pleasure of tourists, and in the commercial economy of time. Before the establishment of the Edinburgh steamers, the Leith smacks were often two, three, or as many as five weeks, reaching London; so completely were they under the control of the rough winds of the German Ocean. But now, a time varying from forty to forty-eight hours suffices to waft one of the fine steamers from station to station. Seven or eight years ago, it was estimated, that as many as 25,000 persons voyaged annually between the two capitals in these steamers; but during this, the Exhibition year of 1851, the traffic by these steamers has been quite enormous. Besides those running direct from the Forth to the Thames, there are others from Aberdeen to the Shetlands, to Inverness, to Edinburgh, to Hull, and to London; others from Edinburgh to Dundee and to Inverness; and indeed, wherever there is a considerable town along or near the coast, there a steamer is pretty sure to be found at some day or other in the week. The Dundee folk have made a bold and happy movement towards opening the doors of the continent to tourists from Scotland. A few years ago, two holiday trips were got up by steam-boat

they should be landed either at Scanderoon or Antioch (at the extreme eastern end of the Mediterranean, southward of Asia Minor); that the pieces should be conveyed by land carriage a distance of 122 miles to Bir, on the Euphrates; that they should be there put together; and that the whole expedition should steam down the Euphrates from Bir to its mouth at the Persian Gulf, a distance of about 1,200 miles. The Government assented; the expedition was made in 1835-6 and 7. Short sketches of the results were published in 1838, and a large work is in course of publication. The possibility of descending the Euphrates in a steamer had been demonstrated; although the means of braving the difficulties of the route had yet to be devised. It had been ascertained, also, that good fuel was procurable on the banks, and that the natives were willing to cultivate a trade in any commodities which they had to sell. The point of the Euphrates which is soonest and most easily reached from Scanderoon or Antioch, whether at Bir or at Balis, is several hundred feet higher than the sea; and this will continue to be one of the gravest difficulties connected with the route. There are only two really formidable obstacles in the 1,100 miles of the Euphrates' course from Balis downwards; viz., hidden rocks at Karabla, and shallows at Lamlum. The former might be removed by blasting with gunpowder; the shallows will require either transshipment into very small boats, or the cutting of a canal 23 miles long. If a railway were formed from the Mediterranean to Balis, the rocks cleared away at Karabla, and the shallows superseded by a canal at Lamlum, the distance from Southampton to Bombay might, perhaps, be traversed in 21 days (= Southampton to Antioch, 12; Antioch to Bassorah, 4; Bassorah to Bombay, 5); and if the Trieste route were adopted between Southampton and Antioch, the time would be still shorter. But if the land transit be by horse or dromedary; if the Karabla rocks so remain that the steamers cannot travel by night; and if transshipment take place at Lamlum;—the advantages are lost, and the Suez route becomes quicker and easier than the Euphrates route.

INDIA MAIL—"LONDON TO CALCUTTA IN SEVEN DAYS."

Of all the daring projects of this locomotive age, assuredly none can overtop that which has been recently announced under the title "London to Calcutta in Seven Days!" What a pleasant tourist's dream we may indulge in! A Londoner obtains a month's vacation from his ordinary labours; he packs

a few odds and ends into his carpet-bag; starts for Dover; stops at Constantinople for a few hours, to catch a peep at the Sultan; rattles over Syria and Lebanon; drops in upon Dr. Layard and Major Rawlinson at Nineveh, to look at their "diggings;" has a little refreshment at the first-class stations,—such as Bagdad and Bussorah; gives the go-by to the Bedouins and the Beloochees; nods to the Ameer of Scinde as he passes; crosses the Indus viaduct (a tubular bridge, for aught we know); takes in a fresh supply of coke and water at the Punjaub Junction; receives and loses a few fellow-passengers at Delhi and Benares; makes a detour to Nepaul, to call in upon our recent visitor, Jung Bahadoor; and to Assam, to look how the British tea-plantations are going on; stops two or three days to enjoy the "lions" of Calcutta; takes an excursion steamer to Borneo, to see the Rajah and the Dyaks and the antimony mines; and steams home again.

Such a tourist's dream would not be much more extravagant than the project itself: but if, instead of heading the pamphlet with such a catchpenny title, the projector had simply pointed out available features in various parts of the land-route from England to India, a little steady consideration instead of a useless vision might have resulted. Let us, then, see what really are the leading points in the plan.

Most of the saving of time, in travelling to India, has resulted from substituting land passage for water passage in certain places, as will be more fully noticed presently; and it is an extension of this system which is advocated in the pamphlet under notice. It is to increase the use of the locomotive on the route to India. There is now railway communication open from Ostend to Laybach, very near Trieste, at the head of the Adriatic Sea. It is proposed to make a railway from Trieste through Bosnia and Servia to Orsova, whence another length of 350 miles would bring us to Constantinople. What an engineer would think of the Balkan Mountains, and how much capital he would require to cross them, we are not told; but it is stated, that "The Turkish Government are most desirous to see this accomplished; and our ambassador has more than adequate influence with the Sublime Porte to facilitate the arrangements necessary to the undertaking through the Ottoman dominions." Supposing (and it is a formidable supposition), the 700 miles of railway from Trieste to Constantinople to be formed, through a very rugged country, we should then have the European line completed, and Asia would next

come under notice. There is already a steam communication from Constantinople to various towns on the coast of Syria; and at the northern part of this coast the river Orontes enters the Mediterranean. The plan involves the formation of a railway up the valley of the Orontes, across the intervening country to the Euphrates, and down the valley of this great river to Bussorah. The projector gives a *couleur de rose* to the nature of the country, the inclinations of the Turkish Government, and the power to give efficacy to those inclinations; and he is not in the least startled by the length (700 miles), which this Euphrates railway would require. From Bussorah steam navigation is now occasionally kept up with Bombay, and might easily be extended. But if the overland principle be still further acted upon, there must be a railway from Bussorah to the Indus; and a pretty railway it would be, having some 1,200 miles of desert in Persia and Beloochistan.

This mighty scheme involves, therefore, four separate railway enterprises, besides steam-boat aid; viz., a railway from the Austrian system to Constantinople; a railway from the Mediterranean to the Persian Gulf, by the Orontes and Euphrates valleys; a railway from the Persian Gulf to the Indus, along Southern Asia; and an Indian railway from the Indus to Calcutta. When any one of these four is completed, it will be time enough to discuss the merits of this new route to India.

We shall now return to the proper subject under discussion, —ocean steamers, in connection with mail routes.

#### INDIA MAIL—RED SEA ROUTE.

The same Committee of the House of Commons which recommended the Euphrates expedition, also recommended the establishment of a monthly mail to India, *vid* Alexandria and the Red Sea. The Government accordingly arranged for a mail steamer to begin to start in January, 1835. Mail packets had been accustomed to arrive at Malta from Falmouth about the 20th of each month; and it was proposed that the new steamer should meet the packet at that island, and carry the mails on to Alexandria. The steamer would thus be employed in carrying mails to and fro between Malta and Alexandria. The Government at the same time suggested that the East India Company should provide steam conveyance for the mails from Suez to Bombay; and sought the good offices of the Pacha of Egypt to facilitate the transit across the Isthmus of Suez. The East India Company shrank from the burden of bearing the

whole expense of the transit from Suez to Bombay, and suggested that the Government should bear part of it. Two new steamers were, however, built by the East India Company.

A new system arose out of an offer made by a proposed Company, in 1836, afterwards the Peninsular and Oriental Steam Navigation Company. They offered to dispatch monthly from England a steamer, of competent size and power, to Cadiz, Gibraltar, Malta, and Alexandria, with the Peninsular, Mediterranean, and India mails; that they would also send a monthly mail from Suez to Bombay, in connection with the former, and would make arrangements for the land transit over the Isthmus; that they would expend a capital of 250,000*l.* in building the requisite steamers; that they would bear the whole expenses of conveying mails, dispatches, and passengers; that they would look for a return for their capital from three sources, —passengers' money, paid by the public, and fixed specified sums paid annually by the Government and by the East India Company; and that they would expect to have the monopoly of the Anglo-Indian mails placed in their hands, in return for the great risk incurred by them. The East India Company declined to place the Suez-Bombay route in the hands of a private Company, and repeated the former offer, that the Government and the East India Company should perform the service between them, and share the cost. After much negotiation, a plan was adopted nearly on the basis of the East India Company's proposal; and thus the mail service was performed throughout 1838.

In 1839, the Admiralty proposed to expedite the mails by an overland route through France. The Peninsular Company was at the same time pressing on the Government the consideration of a plan of considerable magnitude. A capital of one million sterling was to be raised; steam ships of 2,000 tons burthen were to be built; the whole service was to be performed by that Company; and Calcutta and Madras were to be brought within the range of operations. It was calculated by the Company that the time from London to Bombay would be thirty-five days, to Ceylon thirty-seven days, to Madras forty days, to Calcutta forty-five days.

The East India Company declined at that time to enter upon this plan; but in 1840, the Peninsular Company contracted with the Government for the line from England to Alexandria; and this service was performed by powerful steamers, which ran the distance in an average period of thirteen days. In 1841, the

Company made renewed offers to the East India Company in respect to the Calcutta route ; and this was followed by an offer from the latter, that if the former would maintain a monthly steam communication between Suez, Bombay, and Calcutta, the East India Company would contribute 20,000*l.* per annum, for five years, towards the expenses ; the vessels to be 1,600 tons burthen, and about 500 horse power. This offer, with a few modifications, was accepted, and was acted upon till 1847 : the steam ships *Hindustan* and *Bentinck* being soon afterwards placed upon the route. The first voyage under the new regulation was made in December, 1842.

The provisional agreement with the East India Company with respect to the Calcutta route was for a mail every two months ; but the Steam Company, in 1844, proposed a new arrangement for a monthly mail. According to this plan the outward mail, reaching Suez on the 20th, would reach Calcutta on the 15th of the following month. Government about this time received favourably the proposals of the Steam Company to extend the mail line from Ceylon to Singapore and Hong-kong. After much complicated negotiation, in which the East India Company showed a disinclination to bear so large a portion of the expense as the Government deemed desirable, a plan was at length agreed upon, and a contract signed. By this contract the Peninsular and Oriental Steam Ship Company undertook to maintain a monthly mail between England, Ceylon, Calcutta, Singapore, and Hong-kong ; receiving 90,000*l.* per annum from Government, and 70,000*l.* per annum from the East India Company. This agreement was signed towards the close of 1844, and was acted upon in the spring of 1845 : the duration of the contract being for seven years.

The mail contracts in force with the Peninsular and Oriental Company in the beginning of 1849, were three. 1st. Southampton to Vigo, Oporto, Lisbon, Cadiz, and Gibraltar, three times a month ; distance of the voyage 2,400 miles ; annual payment 20,500*l.* 2nd. Southampton to Malta, Gibraltar, and Alexandria, twice a month ; distance of the voyage 6,084 miles ; annual payment 44,025*l.* 3rd. Suez to Aden, Ceylon, Madras, Calcutta, Penang, Singapore, and Hong Kong, once a month ; distance of the voyage 15,590 miles ; annual payment 160,000*l.* The Southampton and Alexandria contract expired in January, 1849 ; whereupon a new tender was sent in by the Company, and another tender by a newly-formed Company, the India and Australia Mail Company. The Government eventually

made a new contract with the old Company, on lower terms than before.

It may be interesting to note the duration of the voyages of this Company, under ordinary circumstances:—

	Days.		Days.
Southampton to Vigo . . . .	3	Southampton to Aden . . . .	27
Oporto . . . .	4	Bombay . . . .	35
Lisbon . . . .	6	Ceylon . . . .	41
Cadiz . . . .	7	Madras . . . .	45
Gibraltar . . . .	8	Penang . . . .	46
Malta . . . .	11	Calcutta . . . .	48
Constantinople . .	16	Singapore . . . .	49
Alexandria . . . .	16	Hong Kong . . . .	55
Suez . . . .	19		

Besides the steamers on the main or Alexandrian route, this Company also keeps up a monthly communication with Constantinople, Samsoun, Sinope, and Trebizond, on what may be termed the Black Sea route.

About thirty steamers are employed in maintaining the mail service between England and Gibraltar, Gibraltar and Malta, Marseilles and Malta, Malta and Alexandria, Malta and Constantinople, Suez and Ceylon, Ceylon and Calcutta, Ceylon and China. The large steamers of this Company are from 400 to 520 horse power; they cost from 50,000*l.* to 90,000*l.* each.

The passage to Bombay, on account of the resistance of the East India Company to all other plans, is thus performed: the Peninsular Company's steamers start from Southampton on the 29th of each month to Malta, whence Her Majesty's packets take the mail to Alexandria, and the East India Company take it onward from Suez to Bombay.

The activity now exhibited at Alexandria, in connection with mail steamers, is quite remarkable. Two English steamers arrive from Southampton monthly on the 5th and 18th respectively, with mail dates to the 24th and 7th. Two French from Marseilles, on the 11th and 30th, with English dates of the 29th and 19th, and Paris dates of the 1st and 21st. An Austrian steamer arrives from Trieste on the 2nd, with Trieste dates of the 27th. Two Austrian steamers, on alternate Mondays, from Smyrna, bringing intelligence by branch vessels from Trieste and Constantinople. Two Egyptian steamers, at irregular intervals, from Constantinople. An English steamer from Beyrout, on the 5th, bringing Syrian news to the 2nd. There are thus ten mail steamers arriving in Alexandria

monthly—certainly among the most remarkable commercial phenomena of the age.

In May 1851, the Peninsular and Oriental Company commenced the performance of a new project. This is a *direct* line of steamers from Calcutta to Penang, Singapore, Hong Kong, and Shanghai : having, among other improvements, a system of return tickets. The scheme appears to be unconnected with the Government, and to have arisen from the out-door pressure to which the Company is exposed. To the same influence is to be attributed the establishment of extra or auxiliary steamers, every alternate month ; one goes from Calcutta to Suez, and one from Bombay to Aden. An additional steamer also starts from Southampton every alternate month to Alexandria, to accommodate this new traffic. It is candidly avowed, by the Directors, that they do not expect these new projects to pay themselves, at least for some time ; but they are very eager to keep rivals away from the Indian Seas, in respect to the Australian plans presently to be noticed. Moreover, *speed* is such an important element in locomotive success, that the old Companies have much ado to prevent the new from overtaking them. The *Hindustan*, the *Oriental*, and other vessels belonging to the Peninsular and Oriental Company, have had many improvements made in them, which enable them to steam at thirteen miles an hour, and to accomplish the journey from Suez to Calcutta in eight days less than the original contract engagement. Other vessels belonging to the same Company are undergoing similar improvements ; and the effect has been, that India letters arrive in London time enough for reply by the immediate out-going mails—a result not contemplated when the contract was entered into. The *Ganges* (one of the new vessels, 1,200 tons and 500 horse power) has steamed from Southampton to Malta in 187 hours—three days less than the time mentioned in p. 69. The same Company have recently lowered their rates.

The travelling public—that is, those whose destination is in the Mediterranean or in the East—have reason to be well pleased with the impetus which competition has given to this powerful Company ; and there are yet other indications in the same direction. The Directors, watchful of the good results of screw propelling in other quarters, have ordered two vessels of 1,200 tons each, with screw propellers, and 300 horse power ; one of 1,600 tons, with 400 horse power ; and a smaller one for the north coast of China. Nor have the excellent qualities of iron ships escaped the notice of the Company ; for arrangements had been made



for building two splendid iron paddle-wheel steamers, of 2,000 tons and 800 horse power, which it was expected would make the run from Southampton to Alexandria in eight days—only one day more than the present costly Marseilles route. But the Admiralty seem to have some crotchety objection to iron ships for the mail service; and the Company have not been permitted to carry out their plans in this direction.

The same influential Company have not been slow to improve, so far as comes within their power, the transit across Egypt—that singular break in their system of ocean communication. The small steamers on the Nile have hitherto been very inefficient; but one has recently been constructed, at Blackwall, under the Company's superintendence, but at the Pacha's expense, of a superior kind; it is called the *Boulac*, and carries passengers from Alexandria to Boulac, the port of Cairo. From Cairo there are well-appointed omnibus-caravans across the Desert to Suez; this route has been lately improved in many particulars. Mr. Robert Stephenson has been employed by the Pacha to lay down the plan of a railway across the Isthmus, to be constructed out of the state finances; there are at present difficulties between Egypt and the Sublime Porte on this point; but these will probably be surmounted. We are, at any rate, much more likely to have such a railway than the "Ostend and Calcutta Direct."

Viewed as a whole, the Suez route to India presents one of the most interesting features connected with ocean steaming. Before we quit the Mediterranean, we may briefly notice the rapid progress of steam navigation in that important sea. It was in 1828, that mails were first carried to Malta and the Ionian Islands by steam power. In the next following year the Neapolitan government put on steamers between Naples, Sicily, and Malta. Very little further was done till 1837, when France established steamers from Marseilles to Malta, Alexandria, and Constantinople. In 1840, the Southampton and Alexandria service was commenced. In 1841, a Neapolitan Company set on foot a monthly service from Marseilles to Naples, Sicily, and Malta. In 1844, France increased her steam force from Marseilles to Alexandria; and in 1845, Naples also increased her steam-service; but the disturbances of 1848 broke down many of the Neapolitan arrangements. A route was established between Naples and Bombay; but this we believe has failed. In 1847, the Levant Screw Steam Ship Company established a route from Liverpool to Gibraltar,

Malta, and the Levant. In the same year a French Company commenced a line of iron steamers from Marseilles to Malta and Constantinople; and in 1849, Alexandria and Beyrout were included in this service. In 1850, an English merchant steamer, the 'Nile,' began to run from Liverpool to Alexandria. So numerous have these steamers now become—especially in relation to Malta, the central kernel of the Mediterranean—that in the month of June, 1851, no fewer than 33 mail and passenger steamers arrived at Malta, and 37 left, irrespective of war steamers and casual arrivals.

#### AUSTRALIAN MAIL—RIVAL ROUTES.

There are four available modes of reaching Sydney and New Zealand by steam. 1st, round the Cape of Good Hope; 2nd, by the Red Sea and North Australia; 3rd, by the Red Sea and South Australia; 4th, by Panama and the Sandwich Islands.

The route to our Australian Colonies, *vid* the *Cape of Good Hope*, would involve the following distances and times, nearly,

	Miles.	Days.
Southampton to the Cape . . . . .	6,700 . .	30
Cape to Adelaide . . . . .	6,100 . .	28
Adelaide to Sydney . . . . .	1,080 . .	5
Sydney to New Zealand . . . . .	1,200 . .	6
	<hr/> 15,080	<hr/> 69

The Screw Ship Company offer to perform the distance from Southampton to the Cape at the rate of 223 miles per day; and from the Cape to Adelaide at 217 miles per day; but it is doubted in many quarters whether the latter could be performed, without an intervening coaling-station; and the objectors urge that the time is more likely to be 80 days than 69. One advantage which this route possesses over that by the Red Sea is, that merchandize, as well as mails and passengers, could be conveyed the whole way without transhipment. A contract has already been made by the Government with this Company for the establishment of a monthly mail to the Cape only, by screw steamers; and this contract will afford valuable experience in respect to the capabilities of screw steamers for ocean service. The inhabitants of Cape Colony and Natal naturally advocate the Cape route to Australia, as it would give them a monthly steam communication both to the east and the north.

The *Suez* and *Singapore* route to Australia is made up of the following distances (some of the distances are differently estimated by different authorities):—

	Miles.
Southampton to Gibraltar . . . . .	1,150
Gibraltar to Malta . . . . .	1,030
Malta to Alexandria . . . . .	860
Alexandria to Aden . . . . .	1,600
Aden to Ceylon . . . . .	2,150
Ceylon to Penang . . . . .	1,200
Penang to Singapore . . . . .	500
Singapore to Batavia . . . . .	600
Batavia to Torres Straits . . . . .	2,400
Torres Straits to Sydney . . . . .	1,800
Sydney to New Zealand . . . . .	1,200

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 14,490

The Peninsular and Oriental steamers now perform the distance from Southampton to Singapore (including the overland course at Suez) in 48 or 50 days; and it is supposed that about 30 days would be necessary from Singapore to New Zealand, allowing for several stoppages: thus making about 80 days from Southampton to New Zealand. The main feature relied upon in the advocacy of this plan is, that it would render available the whole of the existing arrangements in respect to the India mail. The steamers from Southampton to Alexandria, the transit through Egypt, and the steamers from Suez to Singapore, would all be used for the new route as well as the old. Another point is, that England, the whole of India, China, and the Australian Colonies, would be placed in mutual connection, so that each place could receive mail steamers from all the others once a month; and commercial relations would spring up which do not now exist. So great are these advantages, that it is doubtful whether England and her colonies would consent to abandon the hopes of realising them, even though another mail route were established. The Panama route may be *geographically* the best; but the Singapore route seems as if it might claim the title of being *colonially* the most advantageous: which has the balance of advantages, under all modes of view, is a question yet to be decided. A Committee, appointed by the Legislative Council of New South Wales, in 1846, to investigate this subject, reported in favour of the Singapore route, stating:—"That the least expensive, the most expeditious, and the most convenient and advantageous plan would be to join the China line at Singapore by the inner route through Torres Strait, calling at the projected settlements of North Australia, or Port Essington, and by the usual route thence to Singapore." Two circumstances have here, however, to be borne in mind;

viz., that the North Australian settlement has been tried and abandoned; and that the wonderful commercial activity of the Panama regions, in relation to Oregon and California, had not yet commenced.

Allusion is made above to the "inner-route" from Singapore to Sydney. There is also another route which has its advocates. By the inner-route, or Torres Straits, a ship from Singapore would visit North Australia first, then New South Wales, and would leave the rest of the Australian continent to be accommodated by some other means. But by the southern route a ship from Singapore would touch Australia first on the western side, then south, and afterwards south-east; by which the colonies of Western Australia, South Australia, Port Philip, Van Diemen's Land, and New South Wales, might all be visited in succession, and a monthly mail communication kept up between the respective colonies, as well as between England and the colonies collectively. It is also said that the route is less dangerous than that by Torres Straits. This route would certainly lengthen the period of the voyage from Singapore to Sydney and New Zealand; but it is not without certain advantages in other respects.

The *Panama* route to Australia has been brought into notice since the impetus given to American commerce by the discoveries in California. We shall have to speak presently of Pacific steaming generally; we here notice it simply in connection with the Australian plan.

The calculated distances by the *Panama* route are as follow:

	Miles.
Southampton to St. Thomas (West Indies) . . .	3,620
St. Thomas to Panama . . . . .	1,100
Panama to Tahiti . . . . .	4,490
Tahiti to New Zealand . . . . .	2,280
New Zealand to Sydney . . . . .	1,200
	<hr/>
	12,690

By this route New Zealand is less distant than Sydney; but by the Singapore route Sydney is less distant than New Zealand. The difference in favour of the *Panama* route is 600 miles in respect to Sydney, and about 3,000 miles in respect to New Zealand. The West India mail steamers, under the new contract, make the voyage from Southampton to Chagres (in the Isthmus of Panama) in about 19 days; and it has been calculated that about 45 days would be required from thence to

Sydney—making a total time of about 64 days: 16 or 18 days less than by the Singapore route, and from a week to a fortnight shorter than the Cape route. The Panama route would establish a communication between England and the South Sea Islands, with Tahiti as an admirable port of call. It would also connect the Australian Colonies with California, and the whole western coast of America. Unless the Singapore route can be rendered much cheaper than it has yet been, it will be too costly for general commercial passengers to Australia; whereas the Panama route is placed in the heart of such an enterprising scene of competition, that cheap fares may reasonably be expected, independent of the effect of the shorter distance. The same reasoning would apply in respect to the freight of merchandize. The chief disadvantage of the Panama route, in comparison with the Singapore route, is, that the latter is already supplied to a distance of 8,490 miles; whereas the former is, as yet, supplied to a distance of only 4,720 miles—the Pacific line of steamers being yet to be supplied. There is also the transit of the Isthmus of Panama (presently to be noticed) to be taken into account.

In 1851, a Committee of the House of Commons investigated this important subject. Their Report states:—That the Torres Strait route appears in evidence to be too dangerous for a mail and passenger service; that the screw propeller seems to be gradually becoming more efficient and advantageous than the paddle-wheel principle; that a direct route from Ceylon to Swan River would be the most expeditious; that of these three plans, for which actual tenders had been made to the Government (the Singapore route, the Cape route, and the Panama route), the first would give the greatest security for rapid and certain communication, provided the speed of the Oriental Company's vessels be increased. The Panama route is approved in the Report, so far as regards the smooth transit across the Atlantic, and the opening of trade with America; the Cape route has the choice of being the cheapest, and of involving no transshipments; while the Singapore route is very expensive, and involves a voyage through hilly countries, but connects Australia with India. The Cape line is stated to be by far the best for ordinary goods' traffic, and the most free from possible political interruptions. After comparing all the different routes, under all the aspects which present themselves, the Report favours the Cape route, as that which combines the greatest number of advantages. Under this arrangement the same route would include Western Africa.

the Cape, and Australia. But though the Report expresses a preference for the Cape route, if *one* only be chosen, there is an evident tendency to believe that the Singapore route, and perhaps the Panama route also, will come into practical existence some few years hence.

Arising out of the Committee's Report was the Government advertisement of September, 1851. This is for tenders for a screw steam-ship mail contract, from the Cape to Sydney, in extension of the Cape mails; or for a distinct mail from London to Sydney, by the Cape route. The steamers are to start from each end twice a month. The tenders are to be either for iron or wooden vessels. The speed is to be not less than eight and a half knots an hour on an average throughout. The contract is to be for four years, terminable by either party at twelve months' notice. The time for settling this contract, supposing favourable tenders to be sent in, has not yet arrived.

We will here leave this matter by venturing on a prediction—that if Government will establish a steam route to Australia, *via* the Cape; competition and commerce, Australian gold and Californian gold, Liverpool energy and New York energy, will in the course of a very few years give us also a Pacific transit and a Singapore transit to the same distant but important colony.

#### THE CAPE MAIL.

Mention has been made in the last section of the Cape screw-steamers. A difference of opinion prevailed concerning this contract. Some authorities urged, that as there are now mail-packets to Brazil, which call at Cape Verde, and as this Cape is about half-way to the Cape of Good Hope, a branch mail might be established, which would also accommodate Sierra Leone. The Government, however, saw reason for making a new contract, which was for a monthly mail to the Cape by screw-steamers.

It was in December, 1850, that this important enterprise began—important to the Cape, to Australia, and to screw-ship builders. The Company felt their way by degrees. They started with two screw-steamers from London to Holland, in 1846; in 1848 they placed four more on the Liverpool and Constantinople route; and in 1850 they made the Cape contract here under notice. The 'Bosphorus' left Plymouth on December 18, passed Madeira on Christmas-day, Sierra Leone

on January 2, performed the journey several days within the contract time, and returned to Plymouth on March 12. The voyage was considered satisfactory in almost every respect, and the monthly service has since been steadily kept up. The voyage, each way, has been made in 35 to 40 days, with comparatively small steamers; but when the fine vessels of 1700 tons, now building, are finished and put upon the station, it is expected that the time will be materially lessened.

Plymouth is proud of her Cape mail, and justly so.

#### NORTH AMERICAN MAIL.

A committee of merchants and others was formed at Bristol in 1835, for the purpose of getting up a Steam Ship Company, for a mail line to New York; and Captain Claxton was desired to report on the practicability of such an enterprise. He had visited all the principal ports, and made frequent voyages across the Atlantic. He advised that the vessels for such a line should not be less than 1,200 tons. He found that the fine American 'liners' have an average homeward passage of 24 days, and an average outward passage of 36 days; and he anticipated that such steamers as he recommended might make the journey in 13 days and 20 days respectively. The company was formed; the 'Great Western' steam-ship was built; and the year 1838 witnessed the first transit of a steamer across the Atlantic. In the meantime an Irish company, the St. George's Steam-packet Company, embarked in the same enterprise; and the 'Sirius' left Cork in the same month as the 'Great Western' left Bristol, both bound for New York, and both reaching the place of destination in safety. Never was a boldly conceived plan more successfully carried out, against the predictions of many scientific men. The 'Sirius' left Cork on April 4, and arrived at New York April 23, equal to 161 miles per day; on her return voyage she averaged 167 miles per day. The 'Great Western' left Bristol April 8, and arrived at New York April 23; her average speed was 208 miles per day, while the average speed homeward was 213 miles. In 84 passages, made between 1838 and 1844, the 'Great Western' ran the outward route in an average time of 15½ days, and the homeward route in an average time of 13½ days.

The enterprise of this Company has been a most luckless one, in a commercial point of view. They have failed to secure any government contract; and their private running of steam-boats

has not been remunerative. The 'Great Britain' was built with a view to increase the net profits, by carrying larger cargoes of goods and passengers; but she ran upon the sands at Dundrum Bay; and although released a year afterwards, has never since earned a shilling for her proprietors. This floating giant has recently passed into other hands, and been entirely refitted, preparatory to some commercial career which we hope will prove successful. The 'President' and the 'British Queen' belonged to another company; the former was lost, and the latter was sold to the Belgian Government. The 'Sirius,' too, was taken off the Atlantic route. After the proprietors of the 'Great Western' had been running that vessel for four years, they memorialised the Government for some contract or other, some remuneration for the services which they had been the first to render to transatlantic communication; but competition had done its work; another contractor had been agreed with; and the Government had nothing to give, or would give nothing, to the 'Great Western' and its owners. The 'Great Western,' however, continued to run to New York: the contract with other parties extending (in the first instance) only as far as Halifax.

We must now speak of this competitor. Mr. Cunard came to England from America with the view of improving the communication between the two countries; and a tender which he made was accepted by the Government. The contract was for three steamers, which should maintain a monthly communication in each direction between Liverpool and Halifax, starting on fixed days from each end. The contract sum was 55,000*l.* per annum; but it was soon found that four ships were necessary; and the terms were then increased to 60,000*l.* The tonnage was fixed at 1200 tons. The contract was signed in May, 1839; the first Cunard steamer ran in July, 1840; and the contract was for seven years. A further change was afterwards made, on account of again increasing the number and tonnage of the steamers, and making fortnightly voyages instead of monthly. The three first built steamers were smaller than those afterwards constructed; they were the 'Britannia,' the 'Acadia,' and the 'Caledonia.' The custom has been for the vessels of this Company to carry coals enough for twenty days' consumption, to make allowance for detention, and the vessels have thus never run short of coals. Mr. Cunard for some time held the whole property in this contract in his own hands; but he subsequently sold three-fourths to



other parties at Glasgow, retaining the chief management himself. Mr. Robert Napier, of Glasgow, supplied the whole of the engines for this fine fleet of steamers.

When the contract with the Cunard line was about approaching its termination, the American Government offered inducements for the establishment of a new line of steamers from New York to Liverpool. This would have seriously damaged the Cunard Company, whose American ports were Halifax and Boston; and Mr. Cunard came to England expressly to urge upon the English Government the necessity of extending the operations, both as to the frequency and the length of the voyage. A clause had been introduced into the former contract making provision for some such contingency as this; and the Government, on the pressing representations of Mr. Cunard, consented to enter upon new arrangements. The 'Great Western,' meantime, had regularly carried on the steam traffic between England and New York; but this new contract startled her proprietors. It was in the autumn of 1845 that the negotiations were going on; and in the spring of next year the new contract was completed, by virtue of which the Cunard Company undertook to dispatch a mail steamer once a fortnight from Liverpool to Halifax and Boston, and another mail-steamer once a fortnight from Liverpool to New York; the price being 145,000*l.* per annum, and the contract to remain in force till 1858.

The Cunard Company have been recently making redoubled efforts, on account of the energetic proceedings of the Americans. The present competition between the Cunard and the Collins steamers,—the British and the American build,—is highly interesting and important. Much newspaper controversy took place respecting the September voyages, in 1850, of the 'Asia' and the 'Pacific,' the former belonging to the English, and the latter to the American Company. The 'Asia's' outward voyage from Liverpool to New York was made in 10½ days; and the homeward voyage in 10½ days. The 'Pacific' made the voyage from Liverpool to New York in about 10½ days. After making allowance for direction of currents, detention of the 'Asia' at Halifax, &c., the Americans claim the victory, in having made the quickest voyage ever known from Liverpool to the United States; but it is admitted to have been nearly a "neck-and-neck affair." The first experiment made by the Americans in Atlantic steaming was in 1849, on the Bremen route; and the 'Atlantic,' the first

of the Collins line, made its first voyage to England in July, 1850; so that the United States' ship-builders were naturally gratified with the success of their labours; while the Cunard party felt as though there had been a little loss of national honour on the part of England. The subsequent voyages of these fine vessels, however, have not borne out the alleged superiority of the American build, notwithstanding the greatly larger horse-power.

The United States Government, desirous to encourage the formation of a steam navy, have entered into contracts for the building of four lines of mail-steamers, so constructed that by a little modification they could be employed as war-steamers. One of these lines is from New York to Liverpool, and is to be served by five splendid ocean steamers. They are named the 'Atlantic,' the 'Pacific,' the 'Arctic,' the 'Baltic,' and the 'Adriatic;' and they start from either end of the route once a fortnight. These noble vessels will inevitably take some of the commercial profit from the Cunard Company, and some of the postage revenue from the British Government. The United States' steamers are all nearly alike in size and power; the tonnage is upwards of 3000 tons; there are two cylinders of 8 feet diameter and 9 feet stroke; the paddle-wheels are 34 feet diameter by 12 feet deep; the breadth of beam, 45 feet; depth of hold, 32 feet. There are four boilers, each about 22 feet long, 14 wide, and 13 high; and these are so fitted with vertical tubes, that there are no fewer than 5032 tubes in the whole of the boilers. The interior of the vessels is arranged more in the American than the English style. The dining saloon is before the engine-room, while the main saloon and the ladies' saloon are abaft; and all three are fitted up in a most sumptuous style. The 'Pacific' is said to have cost 115,000*l.*; and the others are probably not less costly. Mr. Collins originated the Company, and planned the general build and arrangements of the steamers; Mr. Farrar superintended the construction of the machinery; Mr. Jacob Bell built the vessels; the Allaire Company built the engines, from the designs of Mr. Copeland; and Mr. Pratt designed the interior fittings. All these parties are, we believe, resident in the United States; so that these magnificent vessels may consistently be viewed as exemplifications of what the energetic republic can effect.

Taking into view the operations of the two Companies, therefore, we find that there are noble steamers leaving Liver-

pool for New York every week, and for Halifax and Boston every alternate week.

It has been stated that the Cunard steamers have machinery of so ponderous a character, as to weigh 1000 tons per vessel, including engines, paddle-wheels, boilers, water in the boilers, and coal-boxes; this, for 800 horse-power, gives  $1\frac{1}{4}$  tons weight of machinery for each horse-power. The United States' steamers are not so heavy in this respect. Some engineers are of opinion that  $0\frac{1}{2}$  ton weight of machinery per horse-power would possess all the requisite strength; but about 1 ton is the usual average in this country.

The United States' steamers now navigating the Atlantic, including the Collins line, form, indeed, a magnificent fleet. The 'Atlantic,' 'Pacific,' and their companions, we have already spoken of. Between New York and Havre there are the 'Franklin' and the 'Humboldt,' of 2,300 and 2,500 tons respectively. Between New York and Bremen are the 'Washington' and the 'Hermann,' of 1,700 and 1,800 tons; while between New York, Philadelphia, Charleston, New Orleans, Chagres, and other Atlantic ports on the American coasts, there are nearly thirty ocean steamers, varying from 700 to 2,600 tons.

The two Havre steamers are the first pair out of a group of four, which are to perform a fortnightly mail service between New York and Havre; a contract for eight years having been entered into for that purpose.

Whatever may be the result of American enterprise in steam ship-building, nothing can damp one's admiration of those splendid ships which the Cunard Company have placed upon their line. Whether named after countries or continents, they are all fine. The 'Britannia,' 'Acadia,' 'Caledonia,' 'Columbia,' 'Hibernia,' 'Cambria,' 'Niagara,' 'Canada,' 'Europa,' 'Asia,' 'Africa,' 'America,'—they form a goodly assemblage. In 1840, the Company were content to give about 1,200 tons burden to the first four on their list, and Robert Napier put 440 horse-power into each of them; but in 1850 the majestic 'Asia' and 'Africa' appeared, with 2,200 tons, and 750 horse-power to each.

The screw is running a race with the paddle, in the Atlantic as well as in the Mediterranean. Liverpool is the great point of departure in the Old Hemisphere, and New York in the other; but Glasgow and Philadelphia have put in their claim to a share in the traffic. Very recently, a steamer of a mag-

nificent character has been launched at Glasgow; she is called the 'City of Glasgow,' is built of iron, and is propelled by a screw. She was launched in February last, and was ready for her first voyage across the Atlantic in April. She carried a full complement of passengers on her maiden trip from Glasgow to New York, besides a valuable cargo. In a subsequent voyage she went to Philadelphia, and performed in twenty days a voyage which usually takes the fine packet-ships from fifty to seventy days. Three new screw-steamers have been commenced, two in America and one on the Clyde, to run in conjunction with the 'City of Glasgow,'—a significant proof that the screw performs its duty well upon the Atlantic as elsewhere.

Before leaving the United States and its busy steam enterprise, we may mention that screw *emigrant* steamers are about being built at New York, on a principle which will go far to do away with the heart-saddening details of emigrant voyages. These steamers are to be of immense size, rated at 2,000 tons, but capable of carrying 2,700, and estimated to run from Liverpool to New York, with a full emigrant cargo, in sixteen days. Instead of leaving the steerage passengers, as is now the custom in emigrant ships, to lay in their own precarious and ill-assorted supply of provisions, it is proposed to furnish the supply, wholesome and well-organized, from the ship's stores, at a definite price; thus assimilating, so far, the steerage to the cabin and intermediate passengers, and enabling the emigrants' slender means to be more properly applied than if expended by themselves in preliminary purchases. If such a plan be carried out with sound judgment and with good feeling (which is in itself the best of sound judgment), the misery avoided by the emigrant will be incalculable.

#### CANADIAN MAIL.

Before the repeal of the navigation laws, though foreign vessels could trade up the St. Lawrence, they were prohibited from bringing the produce of Canada to this country; they might take cargoes or emigrants thither, but had to return in ballast. Hence few foreign ships thought the Canadian trade worth attending to. British ships alone could bring cargoes from Canada; but as the merchandise sent from England to Canada is much less bulky and weighty than the timber, &c., brought from Canada to England, more than three-fourths of the ships went out in ballast. The consequences of these regu-

lations were, that foreign vessels could scarcely be employed at all in the trade; and that British vessels had to charge a high freightage, on account of having very little cargo outwards. The Canadian trade consequently took another route; cargoes and emigrants went out by way of New York, because the ships could readily obtain return freights from thence; and the United States' agriculturists sold their corn to the exclusion of the Canadians, on account of the high freightage which the latter had to pay. The emigrants and cargoes shipped to Canada *via* New York, were conveyed inland by the Hudson and Erie routes; and the noble St. Lawrence was left comparatively deserted.

But the repeal of the navigation laws has altered this unnatural state of things. Ships, whether British or foreign, will now select the St. Lawrence, or the New York routes, according to their relative fitness, without being hampered by such absurd restrictions. Around the great Canadian lakes there is rapidly growing up one of the largest and most intelligent agricultural communities anywhere to be met with; and these States will communicate with Europe and Eastern America, either by the Welland Canal and the St. Lawrence, or by the Erie Canal and New York. It behoves the British legislature to do all that enlightened measures can effect, to to keep a legitimate share of this stream of traffic upon the St. Lawrence route. Steam vessels have run, and do now run, the whole distance from Chicago (at the head of Lake Ontario) to Quebec, a distance of 1,600 miles, in 10 days, by way of the Lakes and the St. Lawrence. The water distance from Chicago to New York is also 1,600 miles; but of this there are 364 miles of canal, against only 70 miles of canal in the St. Lawrence route; the time employed is 18 days, and there is a transshipment of the goods both at Buffalo and at Albany. The voyage from Quebec to England, however, is longer and more exposed to ice in winter, than that from New York to England: hence it has to be determined on which side the balance of advantage lies.

There is now in course of construction a railway from Montreal to Portland in the State of Maine, which will by-and-by form another outlet for Canadian traffic. The British Government, also, have been endeavouring to ascertain whether a railway might be constructed from Halifax to Quebec by way of St. John's, thereby accommodating the three colonies of Nova Scotia, Canada, and New Brunswick. Commissioners were

appointed to examine the country thoroughly ; but their report, published in 1849, was quite sufficient to stagger the Government. The commissioners examined five routes, the distances of which were as follow :

	Miles.
From Halifax by way of Torcadi River . . . . .	595
" " Bay of Fundy . . . . .	600
" " Miramiebi . . . . .	635
" " Bay Verte . . . . .	652
" " Pictou . . . . .	695

They named the route of 635 miles as being the least objectionable, and as passing 124 miles through Nova Scotia, 234 miles through New Brunswick, and 277 miles through Canada ; but the estimated cost amounts to the startling sum of 5,000,000*l* !

Canada has hitherto had but little to say on the question of ocean mail-steamers ; but when her population and industry have had a fair field for development, by liberal commercial arrangements, we shall possibly see the St. Lawrence laden far more than at present with the produce of the west ; while the Montreal and Maine Railway will probably be a medium for postal communication.

The Quebec Board of Trade have recently memorialised the Governor and Council to lend their aid towards the establishment of a line of screw-steamers from London and Liverpool to Quebec. By an ordinary sailing vessel the route to Quebec occupies about ten days longer than that to New York ; but it is estimated that, by screw-steamers, the excess need not be more than two days. As large numbers of emigrants go to Canada, it is supposed that emigration and merchant traffic combined would support a line of screw-steamers, independent of any mail contract.

There can be very little doubt that, either by the construction of railways, or by the establishment of ocean steamers, or both, the British American Colonies will shortly have a much more commercial character imparted to them than they have yet enjoyed.

#### WEST INDIA MAIL.

Until 1841, the mail arrangements with the West Indies were exceedingly defective. Sailing mail-packets went twice a month from England to the West Indies, and once a month to Mexico ; but there was no packet communication between Mexico and the West Indies, and very inefficient communica-

tion between the West Indies and America generally. Under these circumstances, the Government made a contract with the West India Mail Company to establish a fortnightly mail to the West Indies, in steamers of 400 horse-power; the route being so planned as to accommodate the whole of the islands, as well as the adjacent American territories. The contract was made for ten years, from 1842 to 1851 inclusive, for a payment of 240,000*l.* per annum.

The main voyage contracted for was a circuit, starting from Southampton, calling at Corunna, Madeira, Barbadoes, St. Vincent's, Granada, Santa Cruz, St. Thomas, Turk's Island, Nassau, Bermuda, and Fayal, and returning to Southampton, a total distance of 9,208 miles. A second route, taking the mails from Barbadoes, went by way of Tobago, Demerara, Berbice, Surinam, Paramaribo, and back by the same route to Barbadoes, a distance of 1,300 miles. A third route, taking the mails from Granada, went by way of Trinidad, Laguayra, Puerta Cabello, Curaçoa, Mayaguess, St. Juan, St. Thomas, Santa Cruz, Curaçoa, and back to Grenada; a distance of 2,185 miles. A fourth route, taking the mails from Barbadoes, went by way of St. Lucia, Martinique, Dominica, Guadaloupe, Antigua, Montserrat, Nevis, St. Kitt's, Tortola, St. Thomas, St. Juan, Turk's Island, and back to Barbadoes nearly by the same course, a distance of 2,066 miles. A fifth route, taking the mails from Turk's Island, went by way of Cape Nicholas, St. Jago, Kingston (Jamaica), Carthagena, Chagres, River St. Juan de Nicaragua, and back to Turk's Island; a distance of 2,520 miles. A sixth route, taking the mails (by sailing schooners) from Curaçoa, went by way of Bahia Honda, Maracaibo, Santa Martha, Carthagena, and returned to Curaçoa; a distance of 1,075 miles. A seventh route, taking the mails from Turk's Island, went by way of Havannah, Belize, and Nassau, returning to Turk's Island; a distance of 2,420 miles. An eighth route, taking the mails from Havannah, went by way of Vera Cruz, Tampico, New Orleans, and back to Havannah; a distance of 2,355 miles. A ninth route, taking the mails from Havannah, went by way of Nassau, Savannah, Charleston, New York, and back by the same route to Havannah; a distance of 4,050 miles.

This system is equally comprehensive and remarkable. It comprises a total distance of 27,179 miles; it arranges for stoppages at nearly sixty islands and ports; and it affords means for all those islands and ports to correspond with each

other, with the mother country, and with the United States. A glance at the scheme will soon explain how the system is managed; when the *through* steamer stops at the principal stations, branch steamers are ready to take on the mails to islands which lie out of the main route; so that a large fleet of steamers is required for this service. In January, 1849, the Company had fourteen steamers. They have also entered into contracts for the supply of five noble steamers, for the service of the West India line, of upwards of 3000 tons burthen. So immense are these vessels, that the building has been allotted to five different firms. One of them, the 'Demerara,' has recently been launched at Bristol, the engines by Messrs. Caird, of Greenock. The entire route which each of these vessels will follow under the new system, out and home, will be about 10,500 miles. This arises from the circumstance that the old contract with the Government has been somewhat modified, in order to place Chagres (Isthmus of Panama), in quicker communication with England. A new contract was entered into in 1850, to last till 1862; the terms are the same as before (240,000*l.* per annum); but the mode of conducting the arrangements is, in some respects, to be more efficient.

The Island of Bermuda is so isolated from all others, and from the mainland of either continent, that the Government have been obliged to make a separate contract for the conveyance of the mails to and from it. Mr. Cunard has for thirty years had a contract for a mail from Halifax to Bermuda; the distance was performed by sailing-packets till 1848, when the contractor substituted steam-packets, without any additional charge (4,460*l.* per annum). Mails are despatched twice a month from Halifax (on the arrival of the mails from England) to Bermuda, in steam-vessels of 80-horse power; the duration of the voyage being about four days. The Bermudians are very dissatisfied with their present position in respect to mails.

#### SOUTH AMERICAN MAILS.

South America has been strangely overlooked, in respect to mail intercourse with England. There has been a slow, old-fashioned spirit pervading the arrangements, very different from that which the more northern route exhibits. Until recently, Brazil, Buenos Ayres, and Uruguay have had postal communication with England by six Government sailing-vessels, which started from Falmouth, and were commanded by officers of the Navy, almost independent of the Post-office authorities. They



left Falmouth on the 4th of each month, and made the journey very slowly.

In December, 1850, however, the Government concluded a contract with the West India Mail Company, to run a line of steamers to Brazil. The first started in January, 1851. The service comprises a monthly start from Southampton on the 9th, to Lisbon, Madeira, Teneriffe, Cape de Verde, Pernambuco, Bahia, and Rio de Janeiro. Branch steamers work from Rio to Monte Video and Buenos Ayres; so that the mails are thus carried nearly to the southernmost point of America.

But the Liverpool merchants are not satisfied with this arrangement; they have a little jealousy of Southampton; and they moreover wish to expedite the transport of goods between Liverpool and Brazil. Brazilian coffee is largely used in the north of Europe; and there is a desire to make Liverpool the depôt for this coffee. It is urged that screw steamers could deliver the coffee into Liverpool in 25 days; whereas from two to three times this space of time is consumed in the transit by sailing-vessels from Brazil to the continental ports; and the quality of the coffee would be better after the short than the long voyage. Arising out of these considerations, there has been formed at Liverpool a *South American and General Steam Navigation Company*; a charter has been granted by the Government, and the shares of the Company are chiefly held by Liverpool and Manchester merchants. It is considered that, as British goods to the value of five millions sterling are annually exported to Brazil and La Plata, a share of this commerce will be obtained sufficient to support a line of steamers. There are to be five first-class steamers from Liverpool to Brazil, with a branch steamer to La Plata. They are screw-steamers, 1,500 to 1,700 tons, and finely appointed. They are to start from either end monthly, and call at Lisbon for passengers and fuel. It is calculated that they will make the passage to Rio in 25 days, and to La Plata in 35. The year 1852 is to witness the first voyage of this company's steamers.

#### PANAMA AND PACIFIC MAILS.

England, the United States, and the South American republics, are all taking measures for establishing mail-steamers in the Pacific, or encouraging them if established by others.

In 1847, when the discovery of the riches of California began to excite so much attention in America, and when the settlement of the Chinese disputes had led to the opening of many Chinese

ports both to the British and the Americans, the United States Government and Legislature entered earnestly into the investigation of the best mode of traversing the Pacific by steam-power, to connect Panama both with California and Oregon, and also with India and China. Towards the close of that year, Lieutenant Maury, superintendent of the National Observatory at Washington, pointed out that the route from Panama to Oregon is very nearly in the *Great Circle* route from Panama to China; so that, if steamers could navigate the Pacific from Panama to China, they might take Oregon and California in their way. This discovery (which results from a careful examination of a terrestrial globe, a map being ill-fitted to show it\*) placed the steam navigation of the Pacific in an entirely new point of view; which was fully illustrated by Lieutenant Maury, in a letter copied into some of the English journals in 1848.

The Panama passage has occupied public attention, not only for years, but almost ever since the Spaniards obtained a footing in that country. The Isthmus which connects North with South America is so narrow, that many projectors have thought a passage across it might be obtained from the Atlantic to the Pacific. In former times, a *canal* only was thought of; at present, both canals and railways are under consideration. The narrowest part is from Chagres to Panama, near South America. A little farther north is a spot where the Lake of Nicaragua occupies the middle of the Isthmus, with a river flowing from it into the Atlantic. Still farther north, at Tehuantepec, a river which flows into the Atlantic springs from a point very near another river which flows into the Pacific. All these three have been proposed as sites for canal or railway communication. The Panama Railway may, indeed, be spoken of as a certainty. It was commenced in December, 1849. The Company had at that time put under contract the portion of twenty-one miles in length, from the Chagres River to Panama Bay; the contractors being Messrs. Totten and Trautwine. The Mexican Government, also, not to be behind-hand with their neighbours farther south, have granted to a Company the right of constructing a railway across the Isthmus of Tehuantepec. The

\* Among the maps of the Society for the Diffusion of Useful Knowledge are six maps of the World on the *Gnomonic* projection. They have a singular appearance to persons accustomed only to ordinary maps; but they have the advantage of showing *Great Circle* routes in every direction. This arises from the circumstance, that in every map on the gnomonic projection every portion of a great circle is represented as a *straight line*.

Nicaragua Government, too, are making arrangements for a ship canal across their territory; so that it seems probable, before many years have passed, that we shall have three rapid modes of crossing the narrow strip of country which connects North with South America, and of thus placing the Pacific in postal and commercial communication with the Atlantic. It is supposed that the Panama Railway will be finished in 1852. The Nicaragua route was opened in a temporary way in August, 1850. Where the Rio St. Juan enters the Atlantic, between the territories of Nicaragua and Costa Rica, is a town formerly called St. Juan de Nicaragua, but now called Grey Town (the British having some control over the neighbouring territory of Mosquitia). From this town a steamer ascends 90 miles up the river, to Lake Nicaragua, and 90 or 100 miles along the lake to Granada; from which town there is cart-road to Realejo on the Pacific.

In respect to this last-named canal, a convention has recently been agreed upon between the Government of England and the United States, to settle in an amicable spirit a rivalry which might otherwise lead to disastrous results. Both Governments wish to obtain a water communication from the Atlantic to the Pacific across the Isthmus at Nicaragua; and the object of the convention is to facilitate the construction of such a work—on the one hand, by providing for the removal of any local obstacles connected with rival political or boundary claims; and on the other, by affording the necessary protection and security for the outlay of capital, in the execution and maintenance of the extensive works which such an undertaking will necessitate. An American Company had previously obtained from the State of Nicaragua a contract for the construction of a water communication between the two oceans; but it was not so generally made public that the neighbouring State of Costa Rica had likewise conceded rights and privileges for that purpose to British subjects. The claims of the latter, although not so clamorously urged, were not the less entitled to just consideration, and more especially so on the part of the British Government. It was thereupon agreed that the two Companies should be left in possession of their contracts; that the two Governments should no farther interfere than to protect each the Company belonging to its own nation; that both routes should be placed open to fair competition; and that the territories of Nicaragua, Costa Rica, and Mosquitia or the Mosquito shore, should be embraced in the stipulations of the convention.

The principle which actuates both Governments is to make the transit across from one ocean to another free to all the world, on terms as nearly approaching to equality as possible; private enterprise being left to carry out this object as a commercial speculation.

During the summer of 1851, the Nicaragua route has attracted much attention. A tight little iron steamer, the 'Sir Henry Bulwer,' navigates the Nicaragua up to the rapids: a landing here takes place; and another steamer, the 'Director,' navigates the Lake. The whole Isthmus was crossed by one of the Californian mails in 32 hours; and it is calculated, when the arrangements have got into working order, the distance from New York to San Francisco will be accomplished in 24 days. The Nicaragua route is beautiful and healthy; the Panama route is monotonous and insalubrious. It, therefore, remains a curious matter to decide which route will ultimately bear off the palm. The mail-steamers, some of 1200 tons, make fortnightly voyages from San Francisco to Panama.

Up to the present time, no steamer has ever crossed the Pacific. It will be a great triumph when this takes place; for the possible coaling stations are so few, that the supply taken out by any steamer must be immense. It seems not at all improbable that the Americans will be the first to achieve this feat.

#### HOME STATIONS FOR MAIL-STEAMERS.

The selection of British ports for embarking the mails has been a matter of considerable difficulty, owing to the conflicting claims of rival towns.

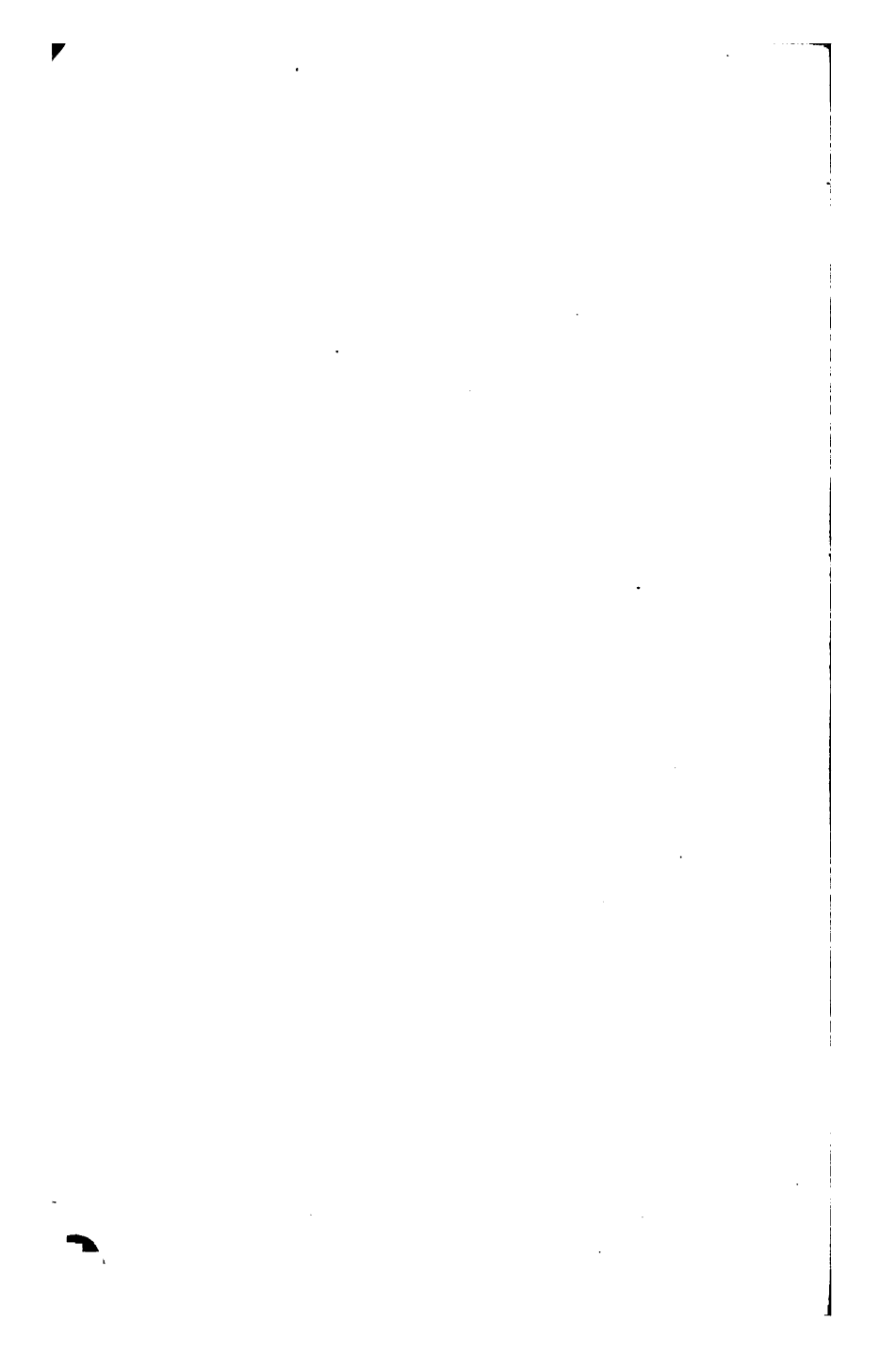
After considerable opposition from the advocates of various ports, the Government finally decided, in August, 1843, that Southampton should be the port of departure for the Mediterranean, East India, and West India mails; and Southampton has continued to be used for this purpose ever since.

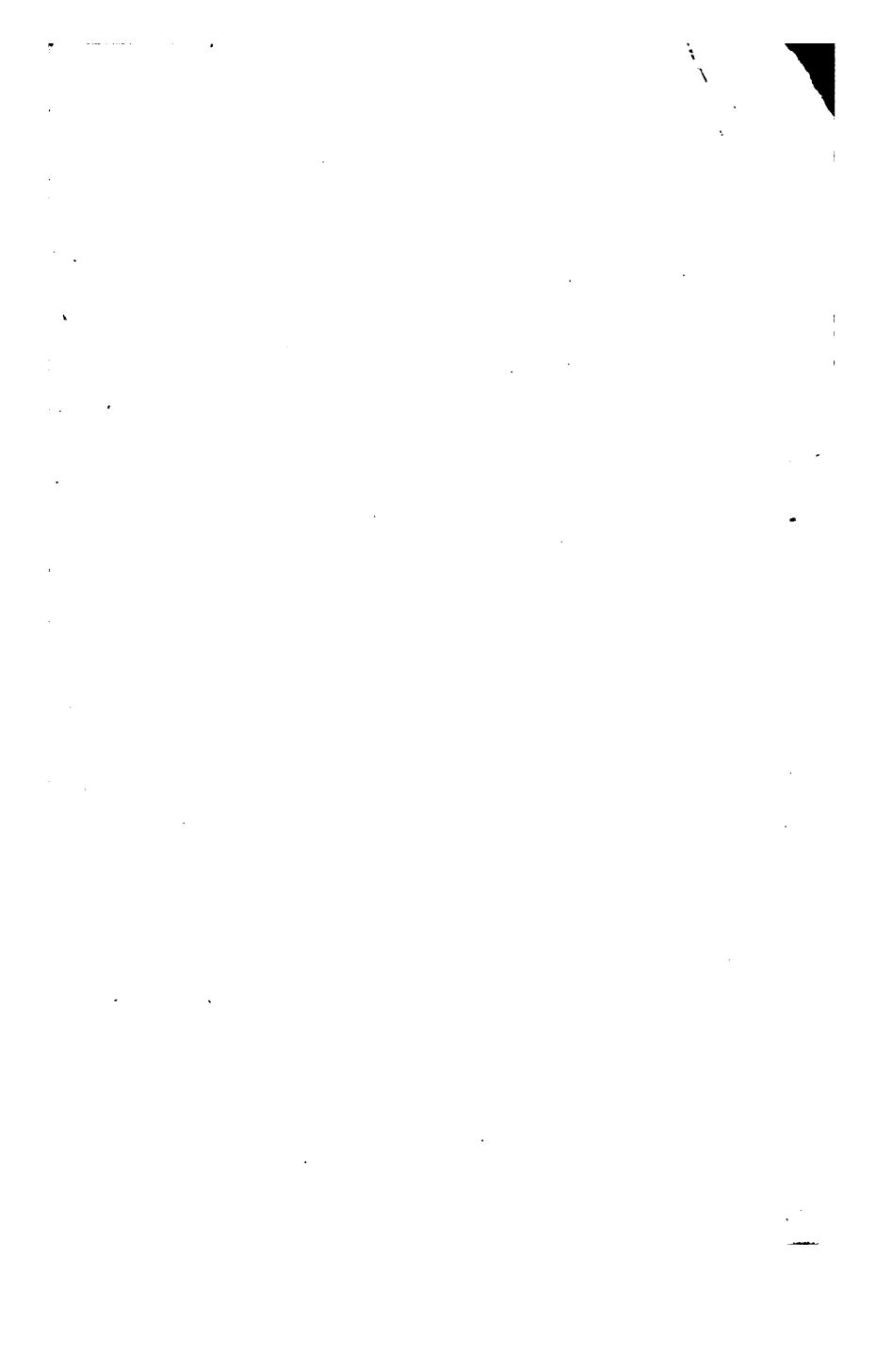
The packet station for France and Central Europe is now Dover; while London is the starting point for the General Steam Navigation Company's vessels, which carry the mails to Rotterdam and Hamburgh. Hull despatches the mails to Northern Europe. *Harwich*, however, is putting forth its advantages as a port of departure for many of these continental mails.

A fine harbour has been formed at Lowestoft, in connection with the railway; and a steamer has been started thence to

Hjerting, in Denmark—much to the astonishment of the sober Danes, who were hardly prepared for such a stroke of enterprise. There must, however, be railways formed in Denmark, before this new route can exhibit any symptoms of success.

There is just now a long contest going on respecting the best port whence to start the American mails. Is it to be an English or an Irish port? Liverpool, and Southampton, and Bristol, of course reply in favour of an English port; while Galway, Limerick, Cork, and other Irish ports, put forth the claims of the "Green Isle." A railway has lately been completed from Dublin to Galway; and the Galway merchants are trying hard to establish a steam-packet line from that port to New York. The distance is 369 miles less than from Liverpool to New York; and the question is, whether this railway is a counterbalance to the disadvantages of transshipment at Holyhead and Kingston. The recent Government investigation has not been favourable to the removal of the packet station to Ireland; while it has been favourable to the claims of Holyhead. It seems extremely doubtful, however, whether Liverpool and Southampton will be superseded as packet stations; and with respect to Liverpool, no government arrangement elsewhere can prevent that from being *the* port for America—so enormous is the trade between America and the cotton districts, of which Liverpool is the chief port.





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